the Skeptical Inquirer

Creationist Pseudoscience

Humanistic Astrology / Project Alpha, Part 2 /
Reducing Classroom Credulity / More on Planets
and Radio / University and the Paranormal

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the Skeptical Inquirer

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Journal of the Committee for the Scientific Investigation of Claims of the Paranormal
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2 NEW AND COMMENT

Issues and Ethics on the University-Pseudoscience Battlefield / *Reader's Digest* and the Paranormal / Science vs. Superstition in India / India's *Science Today* / Uri Awards / Criswell Predicts / In Brief

13 NOTES OF A PSI-WATCHER

17 PSYCHIC VIBRATIONS

ARTICLES

22 Creationist Pseudoscience *by Robert Schadewald*
36 The Project Alpha Experiment: Part 2. Beyond the Laboratory *by James Randi*
48 Forecasting Radio Quality by the Planets *by Geoffrey Dean*
57 Reduction in Paranormal Belief Among Participants in a College Course *by Jerome J. Tobacyk*
62 Humanistic Astrology: A Critique *by I. W. Kelly and R. W. Krutzen*

BOOK REVIEWS

74 Susan J. Blackmore, *Beyond the Body* (James E. Alcock)
78 James Randi, *Test Your ESP Potential* (Gordon Hammerle)

83 SOME RECENT BOOKS

84 ARTICLES OF NOTE

87 FROM OUR READERS

Letters from Michel Gauquelin, Paul Kurtz and George Abell, Henry H. Bauer, H. J. Eysenck, Paul Kurtz, Paul C. Cerny, Phillip J. Klass, Michael Alan Park, W. F. Harris, Robert Wanderer, Richard L. Malvin, Norman E. Tandy, Steven N. Shore and Lys Ann T. Shore

ON THE COVER: *Stars*, painting by Sheila Rose Towne, © 1973 Sheila Rose.

News and Comment

Competency and Controversy: Issues and Ethics On the University/Pseudoscience Battlefield

Does a university professor have a right—indeed even an obligation—to fail a science student whose statements demonstrate such basic misunderstandings of the subject matter as to imply incompetency? Even if the student happened to have passed the formal course tests?

John W. Patterson feels strongly that he does. He furthermore feels universities should strongly support their faculty in implementing such a policy. Says Patterson: "If a faculty member observes a spectacular display of incompetence, whether in class or out, he should no more pass that student than should a quality-control engineer at General Motors pass along engine blocks after observing gaping cracks in them."

This is not an abstract educational issue. It is one of deep concern to Patterson, professor of materials science and engineering at Iowa State University (ISU). There students who espouse creationist views have passed science courses whose subject matter shows that creationist arguments are scientifically untenable.

He reports that professors in the life sciences have given stamps of approval (passing grades and diplomas) to students who have publicly rejected the idea that biological evolution has ever occurred. Earth-science professors have passed students who claim that the universe and everything in it is only 10,000 years old.

He called such cases "spectacularly embarrassing" and said they "could eventually ruin [the university's] credibility" just as much as if a geophysics department passed students who maintain that science proves the earth is flat. A university, says Patterson, owes it to society not to further unfounded notions.

"I suggest that every professor should reserve the right to fail any student in his class, no matter what the grade record indicates, whenever basic misunderstandings of a certain magnitude are discovered. Moreover, I would propose retracting grades and possibly even degrees if such gross misunderstandings are publicly espoused after passing the course or after being graduated."

Shortly after public disclosure this year of the memo he wrote to the instructional committee of the science and the humanities college (on which Patterson then served) outlining this proposal and suggesting the committee discuss it, Patterson was stormed by campus controversy.

Before Patterson's memo surfaced publicly, its recipient, instruction committee chairman Ben Allen, had responded thoughtfully in a two-page

letter. He didn't support Patterson's proposal but did acknowledge that it raised "some very important questions and concerns."

Then in February the student newspaper, the *Iowa State Daily*, reported Patterson's proposal. An editorial in the same issue accused Patterson of McCarthy-type witch-hunt tactics. "Who will determine incompetence? John Patterson?" It said his proposal would "at best stifle and at worst eliminate freedom of academic thought."

A columnist in the student paper crudely satirized Patterson as a McCarthy-like figure teaching Darwinism 324. The next day, Patterson, citing the "complete distortion" of his intentions, resigned from the committee on instruction. He said he didn't want the committee to bear his burden.

Predictably, the controversy quickly centered on the contention that Patterson's idea amounted to condemning students for their beliefs. In fact, the news report, the editorial, and the column all neglected to mention Patterson's express disavowal of that intention.

In his memo to the committee on instruction he had written: "The decision to retract grades and/or degrees should not be made solely on the basis of one's assertions, but also on the arguments he advances to support his assertions. Resorting to arguments based on religious commitments, personal inspirations, revelations and such would not be acceptable defenses; however, logically coherent arguments based on valid evidence would be."

As for who would judge, Patterson had suggested, "Decisions as to what is logically coherent or what is valid evidence would have to be made by appropriate faculty experts or panels who might also be called to task if their rationale(s) reflect academic irresponsibility or scholarly incompetence."

Patterson was initially upset that

Iowa State University

Patterson: Uphold science's integrity.

the student newspaper had omitted the key point that he proposed assessing the scientific quality of the student's arguments, not beliefs, in judging competency. In retrospect, he says the omission, by making his proposal sound more controversial than it was, brought more attention to the issues he wanted raised. He managed to state his rationale for the proposal two more times in letters to the editor responding to the criticisms. "These later letters had a high visibility. I really think it worked to get these issues into the open."

This specific controversy is local to Iowa State, but the general issues involved are not. Some vocal creationists in the United States have science degrees, for example, and this fact is constantly being used by their supporters in an attempt to indicate the

scientific competency of creationist arguments. Also the educational issues are ones that could arise on any university campus.

We recently discussed the controversy with Patterson in a conversation in his office in the Engineering Annex on the Iowa State campus at Ames. He was disappointed at the university administration's lack of support on these matters. He said the university was being "academically irresponsible."

One avowed creationist presenting nonsensical scientific arguments had been dismissed from an evolution course by the professor teaching it, but he had been reinstated by the university. The student, Patterson says, "is as incompetent about evolution as a person can be." The professors at ISU, says Patterson, have become so "browbeaten" by the strident creationists that the general reaction is now to avoid further confrontation—"to be good Germans."

Patterson says he is concerned that the passing of young-earth creationists in science courses is virtually indefensible from both a scholarly and a scientific point of view. This is especially troublesome when the professor is made fully aware of the student's commitment to this kind of creationism because it "gives a rubber stamp of approval to their misrepresentations of the facts of biology, geology, and physics." By discouraging the dismissal or failure of such students in science classes at ISU, the university subtly pressures faculty members "to betray their best professional judgment"—to, in short, lie about the scientific competence and scholarly trustworthiness of their students. When a faculty member yields on this point, says Patterson, he jeopardizes his own credibility as well as that of the university, because too many have come to rely on grade transcripts when evaluating the quality and trustworthiness of graduates in various subject areas. "Thus, there has been a tendency to disregard the responsibilities we owe to the prospective employers of our graduates and to the grad schools who evaluate them for candidacy to advanced-degree programs in science."

"I am concerned about the intellectual damage being done in science and engineering and scholarship. We are betraying the role of the university in critical thinking."

He reiterated the important distinction he suggests in judging student competency. "There is a difference between a person's position and a person's arguments. I suggest judging competency on his arguments—which by the way, is where the incompetence of creationists becomes undeniable."

The whole matter, he acknowledges, raises a series of "very interesting ethical questions."

As for his being a continuing center of controversy at ISU, Patterson seems resigned to playing the gadfly role. This is hardly the first public battle he has been in on the campus. The first was over an ISU professor of family environment's teachings about visible auras, reincarnation, astral projection, and ESP (*SI*, Summer 1978). That controversy received national attention. The next year Patterson found himself beginning a battle against creationism on campus. He was in the unenviable situation of having as his own dean—ISU engineering dean D. R. Boylan—an ardent creationist (*SI*, Winter 1979-80). The aura teacher is still at it, and Patterson still openly battles the creationist arguments of his dean.

The experience has been trying and wearing for Patterson. He has drawn the enmity of much of the university community—not so much for his views as for the aggressive way he presents them. His outspokenness is just his style, Patterson says, and he

can't change. Besides, he says, "if you don't say things in a controversial way, you don't get anywhere."

What support he has from fellow faculty members is mainly of the silent, closet variety, he says, "but there is support there."

One articulate note of support came in a column by an Iowa State professor of journalism, Bill Kunerth. Kunerth praised Patterson for forcing the university to think. He said the issues Patterson had raised over the years were "critical to the integrity of this university." Said Kunerth: "Jack Patterson has identified important issues that deserve airing and I have little respect for persons in positions of authority who ignore him or attempt to undercut his credibility."

Kunerth noted that Patterson is hardly a diplomat—"I can understand why some people find him downright cantankerous." But, he concluded, "I trust that Patterson will continue to stimulate us to think about such issues in spite of the personal sacrifices he makes in doing so."

Another public supporter was William C. Stevens, of ISU's chemistry department, who defended Patterson's proposal against the newspaper accounts and commentaries that misunderstood it. The original student newspaper news report about Patterson's memo, for instance, had mistakenly claimed he defined an incompetent as someone who argues against established scientific principles. Said Stevens, "Patterson knows quite well that arguing against 'established scientific principles' is precisely what keeps science healthy, so long as the argument keeps relatively within the constraints of scientific reasoning and doesn't invoke supernatural phenomena." He further defended Patterson—"a thoughtful and compassionate intellectual"—against the satirist's "insulting caricature" of him. Stevens says his support for Patterson made him a pariah for a time—until Kunerth's column appeared. That, he said, seemed to change attitudes some.

Patterson says the scientific and intellectual integrity of the university is too important for him to give up the fight. "Most professors will go to great ends to avoid a confrontation," he says. He didn't need to add that he wasn't one of them.

—Kendrick Frazier

Promoting the Paranormal: The *Digest*'s Glossy Sales Pitch

You would think a respected company that publishes one of the world's most widely circulated magazines wouldn't have to resort to *National Enquirer*-style statements to sell its books. But the Reader's Digest Association's glossy promotion package of its latest excursion into the paranormal, a picture-packed book called *Mysteries of the Unexplained,* uses every tactic of the seasoned paranormal-pitcher.

The normally middle-of-the-road

There are strange goings on around us.
THERE ARE QUESTIONS SCIENCE CAN'T ANSWER. THEY REMAIN MYSTERIES OF
THE UNEXPLAINED
Have people burst into flames spontaneously?
Why did the statues bleed?
How can a primitive African tribe describe a star they have never seen?
How could Cyrano de Bergerac describe tape recorders in 1648?
What causes "fish rain"?
Who made the 2,000-year old model aeroplane?
How did the prisoner Diderici fade into thin air, leaving his chains behind?

conservative Digest throws all caution to the wind in its mail-order promo package. A four-page letter that proclaims, "THERE ARE DEFINITELY STRANGE THINGS GOING ON AROUND US," is pale in comparison with the four-color foldout that's the real sales-hype. Here the Digest discards all science and reason—perhaps not to offend all those who it says "thirst for the unknown"—and descends into blatant mystery-mongering.

"These Are Questions Science Can't Answer," it begins. "They Remain Mysteries of THE UNEXPLAINED." From there it's into a series of Von Dänikenesque rhetorical questions: "Have people burst into flames spontaneously?" "How did the statues bleed?" "How can a primitive African tribe describe a star they have never seen?"

If only these were cover-blurb teasers, with some semblance of reality to be recovered inside, the Digest might be forgiven. But inside, bad quickly goes to worse. "There are strange goings on around us," the flyer says, and it begins a litany. "A man who could float through the air." "A rectory where barrels of oil poured from walls and ceilings." "A UFO that took people on board for a medical exam." One of the photos in this section shows a supposed fleet of UFOs over the Capitol dome in Washington, D.C. These lights are actually lens-flare reflections of street lights cropped out of the frame (see analysis by James Randi in his *Flim-Flam!* pp. 90–91).

Open the flyer further to its full 22″ × 16″ size, and you enter a world seemingly gone mad. Here "inexplicable phenomena" take you "past the borders of human knowledge." Here obviously science and commonsense are as alien as creatures from another star system. Referring to eyewitness reports that D. D. Home "was observed to levitate many times," it asks, "Can

people really levitate? Some evidence says yes. What do you say?" (The final question seemingly absolves the promoter from providing any of the "evidence.") Regarding spontaneous human combustion, the Digest says, "The phenomenon is established beyond doubt." (It is not established at all.) Miracles such as bleeding religious statues and the so-called Miracle at Fatima in 1917 are presented as fact.

Laughably, the Digest has the gall to claim that its book will entertain the reader with "*reliable* accounts" (emphasis theirs). By "reliable" they apparently follow the tabloid dictum: If anybody has said it or written it, it is reliable.

At another point the flyer asks: "Are unexplained events all isolated incidents . . . or is there a connecting thread running through them?" In the types of anecdotal stories the Digest here hypes, there is indeed a connecting fiber. But it is not one the Digest would like to acknowledge: it is the fallibility of human perception and the credulity of the human mind.

Reader's Digest Books ought to be ashamed of this promotion. The package has been distributed in vast quantities—judging if only from the number of our readers who have called it to our attention. The same pitch is being repeated in ads in pro-paranormal publications like *Fate*. Far more people will read the misstatements and distortions in this flyer than will ever read the book.

Oh yes, the book itself. What about it? The Reader's Digest Association failed to answer repeated requests from the SKEPTICAL INQUIRER for a review copy. But we purchased both *Mysteries of the Unexplained* and its predecessor *Into the Unknown*. Ho hum. The books are not quite as bad as their advertising. Here and there they even make a bow to reason and critical

THE MYSTERY OF STRIPED TOOTHPASTE! SPONTANEOUS COMBUSTION OF CHARCOAL BRIQUETS!
Reader's Digest
MORE MYSTERIES UNEXPLAINED
SI·1983

investigation. But relatively few skeptical investigations are used as sources. Basically the accounts are descriptive—with the descriptions relying on unevaluated testimony. When the case against the reality of the claim is so overwhelming that they have to acknowledge it (the Bermuda Triangle legend, for instance), they sometimes do so. But almost always in a way calculated not to offend the devout believer. As a source of pretty pictures, the books are fine. As a source of reliable information, no.

It is too bad. With the resources the Reader's Digest company has put into these books, they could have done a real public service. The publishers could have helped readers distinguish between the awesome mysteries and

wonders of real science and the bogus ones of the paranormal that science supposedly "can't answer" (not true). They could have taken the gutsy course and forthrightly presented a *scientific* (yet still entertaining) examination of exotic popular claims. Instead the Digest took the low road. The result is nothing worth buying or reading.

—*Kendrick Frazier*

Science's War Against Superstition in India

The scientific community of India is giving battle to the country's "godmen," and the initial results have been heartening.

Popular science movements have been launched by the community in the south and western regions of the nation to blast superstitious beliefs and explain to people that relying on the godmen is as foolish as taking counsel from a donkey.

The godmen represent superstition, which remains a firm part of Indian (as well as other Asian) culture. Superstitious beliefs of the people make the godmen rich and further immerse the victims in ignorance, fumes the community.

As an example of the community's efforts is the Kerala Shastra Sahitya Parishad. The movement attacks blind belief and mysticism.

The people leading the movement call themselves "rationalists." They report that results have been rewarding and that similar movements have been started in the other states.

Joining the fray on the side of the rationalists are such national organizations as the Left Youth Party, the Nehru Science Centre, Homi Bhabba Science Education Foundation, and the Institute of Virology.

Another community effort was a "scientific march" held in Maharashtra state and participated in by a million people. Led by a scientific team called Yatra, the march visited 45 towns in the state, logging 3,000 kilometres.

Composed of speakers armed with charts, graphs and pictures, the team was headed by B. Premanand, 55, a well-known rationalist from Kerala state, who gained nationwide attention by exposing the miracles of the godmen and combating superstition and blind faith. . . .

The most effective feats of the march were the demonstrations made by Mr. Premanand to expose the miracles performed by the godmen to make people believe they have "supernatural powers."

He walked on burning coal without suffering injury to his feet. He explained: "The skin (on soles of the feet) can withstand high temperature for three seconds and this fact explains the miracle. All I did was to walk over the embers quickly but without haste."

He further said that godmen who perform the walking-on-burning-coal trick usually light the fire two hours in advance to secure as big a crowd as possible.

Mr. Premanand invited members of the crowd to also walk on the burning coals after his demonstration. Many did and found that they, too, could perform the trick without injury to themselves.

Another member of the group worked like a magician. He spewed small idols from his mouth, chewed bits of glass, and converted water into honey. He afterwards showed how the miracles were performed—through sleight of hand in the case of the idols drawn from the mouth and conversion of the water into honey.

As for the glass-chewing bit, he informed people that anyone can do it

provided he or she has good teeth, does not have cavities, and eats plenty of bananas before and after doing the trick.

The holy ash trick of the godmen was also blasted by Mr. Premanand. He demonstrated to the crowd that all one needs are deft fingers and swift hand movements. The ash is hidden between the fingers.

While the Yatra has claimed successes in its efforts, it realizes that millions of Indians are still in the grip of superstition. The leaders are hopeful that, with the examples shown, other concerned citizens or associations in the various states will launch their own movement against blind faith and mysticism.

As one top government scientist noted: "Despite the widespread activities of scientists and national laboratories, the message of science has yet to reach the millions. People still go to temples to worship gods and goddesses when they are faced with an epidemic of measles. Even educated people do it, including doctors and members of scientists' families."

—Prakash Chandra

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Science and Criticism in India

Lest anyone get the idea that the *scientific community* in India is unsophisticated, the Indian magazine *Science Today*—not to mention the scientific contributions of eminent Indian scientists—shows clearly it is not. We recently have become familiar with this publication, which is entirely in English. In appearance and scientific and literary sophistication, it is on the level of the wonderful London weekly *New Scientist.* The science published and reported on in the Bombay-based *Science Today* is first-rate and the commentaries are too. Fringe-science comes under the scalpel. The March issue had an up-to-date report on Randi's Project Alpha experiment, and the April issue carried the best and most-detailed review I have yet seen of Rupert Sheldrake's book *A New Science of Life.* Written by the director of the Centre for Cellular and Molecular Biology in Hyderabad, the lengthy review carefully showed how Sheldrake's approach to his hypothesis of "morphogenetic fields" is pseudoscience and (hidden) theology. The reviewer, P. M. Bhargava, neatly contrasts Sheldrake's book with an equally speculative but scientifically argued work, Francis Crick's *Life Itself.* What Crick has presented is "well within the scientific method," writes Bhargava. What Sheldrake presents is "no more than a set of statements which can be accepted only on the basis of faith." Scientists can disagree with the conclusions of both men, notes Bhargava, but Crick's book "is readable, well-argued, and rarely goes beyond facts. When he does so, he makes a clear distinction between a fact and a hypothesis yet to be proven. He does not appear to be selling an idea. . . . Quite different indeed from Sheldrake's book."

—K.F.

Uri Awards: A Straight Spoon Joins Three Bent Ones in '83

Three men are winners of this year's Uri Awards for statements and "accomplishments" in parapsychology. James Randi presented the awards on—as is his custom—April Fool's Day, in a news conference in the offices of *Discover* magazine in New York.

In the academic category, the Uri for the silliest statement made by a scholar went to Dr. Harry Collins of Bath University, England. Randi honored him for a unique case of backwards reasoning. It began with the claim often heard from parapsychologists that skeptical attitudes can inhibit paranormal results. Collins combined this rationalization with the idea that psychic powers work backward and forward in time. The result is the suggestion, advanced by Collins in apparent seriousness, that there can therefore never be a successful experiment to prove psychic forces, since, if there were, skeptics reading about it afterward could project their skepticism back in time to inhibit the experiment. Thus, suggested Collins, it would never be written up at all.

The media winner was a writer for the *National Enquirer,* Paul Bannister. Asked by a now-confessed performer who had posed as a "psychic" if he really believed in the powers he had reported on, Bannister replied: "I don't have to believe in it. All I need is two Ph.D.'s who will tell me it's so, and I have a story!"

The performance category award went to John McCall, the Washington astrologer who took out a newspaper ad denouncing skeptics for refusing to test his amazing astrological skills. Randi's took up the challenge (*SI,* Summer 1983). On a test where the astrologer predicted he could score 80 percent and a chance score alone would have given him 25 percent, McCall scored 20 percent.

Randi gave a special Straight Spoon Award this year to Elsie (Wright) Hill and her cousin Frances (Griffiths) Way. These are the two ladies who in 1916 faked a series of photographs of fairies in Cottingley Glen, in England, endorsed as genuine by Arthur Conan Doyle. The women finally confessed their hoax last year.

—*K.F.*

Criswell Predicts: A Quick Look Back

Few people knowledgeable about such matters took the "psychic" Criswell seriously, but much of the public did. A good guide to the accuracy of his predictions comes from the article "Criswell Predicts Your Next 10 Years," published in the November 1969 *Saga.* Reader Richard L. Tierney recently dug it out of his files. Since the ten-year period it foresaw has now long passed, it is illuminating to recall the predictions. As Tierney says, "They are hilarious in their glaring inaccuracy."

Claims Criswell at the beginning: "Let the record show . . . My predictions come true at an amazing rate . . . I invite the reader to 'keep record' of my predictions and see for himself whether these things come to pass." Here are some of them.

- "I predict that the coming deluge will strike within the years of 1970, hard, fierce and brutal."
- "I regret to predict an American tragedy on Nov. 11, 1980! An instant newsflash from the White House will tell of the first suicide of an American president!"
- "Undersea and underearth volcanoes will reap a harvest of destruction, never witnessed by mankind in 1972-1973-1975!"
- "I predict that the great tidal wave will hit the coastal regions of Southern Asia, destroying Yemen, Saudi Arabia, Iraq Port, Iran, Pakistan, India, Burma, Siam, Sumatra, Indochina, China, Borneo, and half of Australia . . . caused by a giant meteor which will crash into the very center of the Indian Ocean . . . Mil-

lions will perish on April 10, 1975."

• "Mother nature will poison 10 million people thru a deadly gas escaping from the bowels of the earth into the vegetation . . . An atomic bomb will be the . . . disposition of the corpses . . . This shocking event will happen in July 1977!"

• "On a quiet Sunday afternoon, the sulphuric gases from outerspace will sweep the world . . . This gas will strangle and choke to death millions of people . . . This time Man will perish! Date: 1978."

—*K.F.*

In Brief

SI editorial board member Martin Gardner is winner of the 1983 American Institute of Physics–U.S. Steel Foundation Science-Writing Award in Physics and Astronomy. He received the honor for his article "Quantum Weirdness" in the October 1983 *Discover.*

* * * * *

CSICOP scientific consultant Andrew Franknoi hosts a weekly science talk-show on KGO-FM in San Francisco on Sundays from 11 A.M. to 1 P.M. The program includes discussions with local and visiting scientists, timely science news, and examinations of controversial areas like psychic healing, astrology, ancient astronauts, and UFOs. Franknoi is an astronomer, executive director of the Astronomical Society of the Pacific, and editor of its magazine, *Mercury.*

* * * * *

When William H. Ganoe of Tucson, Arizona, bought a Vivitar electronic flash unit, he was chagrined to find that the owner information card the manufacturer asked him to fill out grouped under "Interests and Hobbies" "astronomy/occult." He wrote to the Vivitar Corp. (2700 Pennsylvania Ave., Santa Monica, Calif 90406) to complain. "Such an association is highly offensive to scientists" he told the company. No answer. Says Ganoe: "With things like this is it any wonder that America supports ten times more astrologers than astronomers? How about some letters to Vivitar about this?"

* * * * *

Who needs it? Publishers Central Bureau, Avenel, New Jersey, announced to customers this spring that it was making plans to launch a Mystic Book Society, dealing with "certain phenomena even the most rational

mind cannot fathom, events that confound all attempts at logical explanation." It asked customers to respond by reply card if they feel a mystic book club "is a good idea." If the response was positive, the company said it would go ahead with the plans, starting the club probably in Fall 1983.

* * * * *

A journalist in India who writes mostly for children would like to receive any critical material on paranormal subjects, astrology, superstition, reincarnation, or anything else of like nature, to assist her in providing an informed skeptical viewpoint to her readers. You are asked to send any books, journals, or periodicals to:

Margaret R. Bhatty
No. 2, Pendse Layout
Chhatrapati Nagar
Wardha Road, Nagpur 440 015
India

* * * * *

Local CSICOP-type groups are being formed in the Pacific Northwest (Northwest Skeptics) and in Dallas (Dallas Society to Stop Pseudoscience). Details in our next issue. Annual subscriptions to the Bay Area Skeptics Newsletter have gone up to $7.50 since the item in our Summer issue.

—K.F.

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Notes of a Psi-Watcher

Margaret Mead and the Paranormal

Margaret Mead, who died in 1978, was an intelligent, energetic anthropologist of strong convictions. No one can question the sincerity and dedication of her work or that her influence on public opinion in many fields was as refreshing as it was admirable. This year, as a result of Derek Freeman's book *Margaret Mead and Samoa,* grave doubts have been cast on the soundness of her earlier field studies. Freeman marshals compelling evidence that when Mead investigated Samoan culture she had little comprehension of the need for stern measures to suppress what is now called the "experimenter effect"—the unconscious tendency of researchers to bias data in the direction of intensely held beliefs.

In the publicity surrounding Freeman's attack, surprisingly little has been said about Mead's lifelong interest in the paranormal. I have made no attempt to research this aspect of her life, so what follows is based only on books, notes, and clippings at hand.

In an interview published in this country's leading occult magazine, *New Realities* (vol. 2, no. 2, 1978), Mead spoke of a great-great aunt (Louisiana Priscilla Ramsay) who was said to have the ability to float about rooms, diagnose ills, and read minds. Her family, said Mead, accepted these phenomena as genuine. In her autobiography, *Blackberry Winter,* Mead refers to her aunt as "one who could read people's minds."

As a young anthropologist, Mead's field studies persuaded her that "special gifts" of this sort were common in primitive cultures. Do some cultures have a larger percentage of psychics than others? No, Mead told *New Realities,* cultures differ mainly in how they treat their psychics. Some encourage them, some repress them. "But I didn't find in them any more cases of what you'd call great sensitives than what you'd find here." In Appalachia, she added, children with psychic gifts are taught to conceal them. "It's a great protection, for there's nobody who's more of a nuisance than a psychic child."

In 1942 the American Society for Psychical Research recognized Mead's interest in psi by electing her a trustee (see the society's journal, April 1942), and in 1946 she was appointed to its research committee (ibid., April 1946). In 1969 the American Association for the Advancement of Science, largely because of Mead's passionate advocacy, voted to allow the Parapsychological Association (founded by J. B. Rhine) to

become a member organization.

For sixteen years (1963 to 1979) Mead wrote a monthly column for *Redbook* magazine. In the October 1967 issue she spoke of field work in cultures where "trance behavior is an everyday occurrence," and said that it was her impression "that when individuals are specially chosen, they have extraordinary capacities for exercising the special supernatural powers exhibited under trance." In a later column (March 1977) she described the fantastic upsurge of interest among young people in such practices as astrology and numerology. Although she deplores these obsessions, she thinks they signal a healthy dissolving of barriers that have too long isolated the scientific community from serious investigations of psi:

> And on this growing edge of knowledge, scientists are devising experiments that may—almost certainly *will*—give us, in time, new insight into the powers attributed to seers and clairvoyants, to those who have the power to "see" auras, to communicate with plants, to dream or visualize events outside the bounds of time. . . . Here the most open-minded scientists and the most open-minded believers in occultism can meet and carry out experiments in the atmosphere of expectant, skeptical but also meticulous careful exploration. We are living on the edge of the unknown. . . .

Interviewed by the *New Yorker*'s "Talk of the Town" (March 7, 1977), Mead declared: "Dowsing is a fact, you know." When her interviewer expressed doubts, she added: "Oh, yes. There are people who can dowse, because they have a greater sensitivity to the changes within the physical world. Some people can do it and some people can't."

At the 1974 meeting of the American Anthropological Association, Joseph K. Long organized a symposium on psi research, and later edited

the papers for a collection titled *Extrasensory Ecology: Parapsychology and Anthropology* (Scarecrow Press, 1977). Speaking on "An Anthropological Approach to Different Types of Communication" Mead argued that belief and disbelief should be irrelevant in investigating psi. She strongly objected to such terms as *extrasensory* and *paranormal* because they suggest forces beyond the reach of science. *Other-sensory* would be a better term. She recommended that psi research be part of normal anthropology, not a separate discipline.

One of the great difficulties of such research, Mead said, is that if psi is a normal aspect of a culture's rituals and belief system it is almost impossible to distinguish genuine psi from the counterfeit. Shamans, for example,

constantly resort to trickery. In all her studies of Bali, and the Manus of New Guinea, Mead startled her audience by revealing she had never encountered a single instance she could positively classify as telepathy, clairvoyance, precognition, or psychokinesis. The only possible exception was an instance of precognition—"a drop of oil on a fingernail" that a collaborator had reported. It is much easier, she said, to recognize genuine sensitives in a modern culture where disbelief is prevalent.

"How much intensive research may be needed to find a sensitive when a whole village goes into a trance, or when a whole cult group becomes healers, is a matter for further exploration. But exploration should not be hampered by claims that involve belief or disbelief." Such claims, said Mead, only muddle research. "The point is whether we can find ways of studying these phenomena which will make them as accessible as the stars or chromosomes."

In her introduction to *Mind-Reach* (1977), a now largely discredited book by Harold Puthoff and Russell Targ in which they describe their amateurish testing of Uri Geller and other self-proclaimed psychics, Mead has no reservations about the significance of their work. It demonstrates, she writes, the existence of a "hitherto unvalidated capacity." Their controls, she says, "far outstrip the normal procedures to guarantee scientific credibility." Their investigations are as sound as "the study of communication among bees." Experiments in which psychics describe a "target area" *before* the area has been randomly selected are taken by Mead as strong evidence for precognition. Suppose one precognizes a train wreck. Does this mean that death can be avoided by not taking the train? As Mead correctly perceives, this raises deep questions about determinism and free will. "This issue is not yet faced," she writes, "by the experimenters, but will, I understand, be on their future agenda."

The most embarrassing of Mead's *Redbook* columns was surely the one she wrote for the September 1974 issue in answer to the question, "Do you believe in UFOs?" Her answer is an unqualified yes. That there are waves of "visits" by UFOs, she writes, "seems incontestable." Of course many sightings are hoaxes, but this no more proves that all are hoaxes than similar arguments "demolish the evidence of psychic phenomena." Just because fake mediums sitting in darkened rooms can induce gullible dupes to shake hands with cold, sand-filled rubber gloves, there is no reason to deny the reality of psychic phenomena we cannot yet explain."

Assuming that UFOs are from outer space, she continues, fascinating questions arise: "What are they doing?" and "Why don't they declare themselves?" There is, she adds, "some possible evidence of occasional landings. There is a giant crater in the Soviet Union that cannot be explained by any existing meteorological or geological knowledge. And there are unexplained accounts of brief landings."

What purpose "lies behind the activities of these quiet, harmlessly cruising objects that time and again approach the earth? The most likely explanation, it seems to me, is that they are simply watching what we are up to—that a responsible society outside our solar system is keeping an eye on us to see that we don't set in motion a chain reaction that might have repercussions far outside our solar system." However, Mead cautions, we cannot be certain there is intelligent life aboard the UFOs. "They may well be unmanned vehicles controlled from elsewhere in space." An editor's note

adds that Dr. Mead recommends to *Redbook* readers two "helpful" books: *Man's Contact with UFOs,* by Ralph and Judy Blum, and *Challenge to Science: The UFO Enigma,* by Jacques and Janine Vallee.

Mead could not have picked two more worthless volumes. The Blums said in their introduction: "We predict that by 1975 the government will release definite proof that extraterrestrials are watching us." Philip Klass at once wrote to Ralph Blum proposing a $10,000 wager on this, even extending the time to the end of 1976. Blum never replied.

I have given only sketchy hints of Mead's beliefs about the paranormal. How did she integrate them with her Christian beliefs? In the lengthy article on Mead in the *Biographical Supplement* of the *International Encyclopedia of the Social Sciences,* she is described as "a devout, practicing Episcopalian . . . not only an active laywoman in the Episcopal Church, but also in many ecumenical committees, conferences, and activities of both the National Council and the World Council of Churches." When Mead was asked in *Redbook* (May 1963) if she believed in God, she answered with one word: "Yes." Perhaps someone who knew Mead well will someday tell us in detail about these little-publicized facets in the philosophy of one of this century's most colorful and influential anthropologists.

—*Martin Gardner*

The Psychic Anecdote I

Every psychic anecdote has to have an originator. There are, broadly speaking, two types of people who set the ball rolling.

First, there are those who, faced with an experience or series of events which they cannot understand, fall back on the supernatural as the only possible explanation.

Second, there are those who, firmly believing in the occult (or in their own supernatural powers), are continually on the look-out for its occurrence; these people may read telepathy or clairvoyance or the actions of discarnate spirits into the most prosaic details of everyday life.

—D. H. Rawcliffe, in *Illusions and Delusions of the Supernatural and the Occult* (New York: Dover, 1959)

Psychic Vibrations

In this the centennial year of the death of composer Richard Wagner, it is fitting that a precursor of his famous operatic Ring Cycle should be discovered among the pre-Columbian Norse inhabitants of North America, who allegedly arrived here about 1700 B.C. Perhaps you did not know there were any such inhabitants, but their existence has recently been discovered by Barry Fell, author of *America, B.C.*, which claims to find evidence of Norsemen living in North America centuries before the arrival of Leif Ericson. In his latest book, *Bronze Age America,* Fell reveals that the Norsemen arrived about a thousand years earlier than even *he* had suspected. Fell has deciphered alleged petroglyphs (stone carvings) that tell of the adventures of Wotan, king of the gods, Loge, the crafty god of fire, Fafnir the giant, and even the flying Valkyries. One of these petroglyphs, Fell has discovered, represents the Heavenly Gods under the leadership of Wotan forming a procession to ascend a rainbow into Valhalla, where they will wait for Gotterdammerung—the Twilight of the Gods.

* * * * *

Charles Hickson of Pascagoula, Mississippi, made headlines in 1973 when he claimed that he and a companion, Calvin Parker, were "abducted" by a UFO

and were examined by crab-clawed creatures. Hickson held a press conference last year to reveal that since that night he has been in frequent mental contact with those creatures, and he has met them physically three times since his initial "abduction." He said that during 1983 the UFO creatures would come down "in force." But first, he said, they will change the allegedly self-destructive course of this planet. Hickson said the aliens recently told him that the "energy" will be released on the world early in 1983 and that "by the end of 1983 we'll be softened enough and changed from our bad ways" so that the UFO aliens will be accepted, rather than attacked, when they land. Hickson's "UFO abduction" story is almost universally accepted by UFO believers. For example, J. Allen Hynek, director of the Center for UFO Studies (CUFOS), has said "there's simply no question in my mind that these men (Hickson and Parker) have had a very real, frightening experience. . . . They are absolutely honest." James Harder of the University of California at Berkeley said of this alleged abduction: "We're dealing with an extraterrestrial phenomenon. I can say so beyond any reasonable doubt." How many UFO believers will lose faith in Hickson's stories if the aliens fail to "come down in force" by January 1, 1984, as he has promised? At the risk of becoming precognitive, let me give you the answer now: none.

* * * * *

Some gems from recent issues of *Fate* magazine: "Kill insects and household pests with the power of thought" (from an ad for "psychotronics"); "Can Science Create Life?" (an article in the January 1983 issue suggesting that mites of the genus *Acarus* can be spontaneously generated by electricity from

nonliving matter); "Can reincarnation explain 20th-century Englishwoman's memories of life as 16th-century Scottish king? Or is the mystery deeper and the answer even stranger?" (from editorial introduction to article in the June 1983 issue); and numerous slings and arrows directed at CSICOP for its allegedly unscientific excessive skepticism.

* * * * *

There are dozens of people who claim to have had contact with UFO aliens, but Diane Tessman, who lives near San Diego, is one of the most interesting. Not only was she allegedly "abducted" by UFO aliens; she says that she is not entirely of this world. She is, she believes, half human and half E.T. During her alleged abduction experience, the soul of the "Special One" (an alien being she found particularly attractive) was "implanted into me or duplicated into me electronically, and the 'Special One' has been a part of my

mind ever since." She has also been having flashbacks of "previous incarnations." Tessman has now written a book titled *The Transformation,* telling how UFOs transformed her life and how they are soon to transform civilization. The book's introduction was written by Leo Sprinkle of the University of Wyoming, a leading scientific UFOlogist and one of the world's most prolific "abduction finders." Sprinkle tells how he placed Tessman under hypnosis to learn more about her alien contacts and that "under hypnosis, Diane's reactions were vivid recall, or memories, of real experiences which have a profound influence on her inner character and her personal goals. In other words, these memories were of real experiences as far as she is concerned." As a free bonus to all purchasers of *The Transformation,* Tessman has promised to place the buyer's name on a special "space scroll" to be presented to "the friendly occupants of UFOs who are here to assist humankind in its spiritual development," should she in the future be invited once more onto their craft. She will then request of her alien friends that, when "Doomsday" arrives (which will be soon, it is hinted), the people whose names are on the scroll, all of them peace-loving souls desiring cosmic harmony, should be "evacuated" from our doomed planet before the earth's destruction.

* * * * *

Two Chinese scientists had predicted, based upon planetary positions, that the winter of 1982–83 would be unusually cold. According to a story in *Fate* magazine, Ren Zhenqiu and Li Zhisen examined 3,000 years' worth of climatic data compiled in China. They reportedly found that periods of extremely cold weather are supposed to occur when the earth is on one side of the sun and all the other planets are grouped in a tight arc on the other side, a condition said to have existed in November of 1982. They are therefore predicting "two decades of cold winter and freezing disaster." I don't know what the weather has been like in China this past year, but across most of North America the winter of 1982–83 was exceptionally mild.

* * * * *

This past spring brought some big excitement for MUFON (the Mutual UFO Network, one of the largest UFO groups). In February, MUFON's deputy director, John Schuessler, who works on the Space Shuttle program at the NASA Johnson Space Center in Houston, went to Australia for a series of lectures in which he teamed up with Stan Deyo, a far-out promoter of UFO yarns. One ad for Schuessler's lectures promised: "UFOs, ETs, Death-Rays—Facts & Film. Head Scientist on NASA Space Shuttle Project Speaks Out." Another ad proclaimed: "Head scientist from NASA space shuttle project speaks out on flying saucers, ETs, Death Rays and more! in revelations of extra-terrestrial space technology." Deyo, for his part, cited the UFO pronouncements of Britain's Lord Clancarty (a.k.a. Brinsley LePoer Trench), who believes that the earth is hollow and that UFOs zip in and out of a giant gaping hole at the North Pole.

Then in April, MUFON's people were again in the papers, this time in Albuquerque, with a claim that Air Force investigators recovered in 1950 the remains of three UFOs that crashed in New Mexico and the bodies of three-foot-tall creatures wearing metallic suits. An FBI paper, dating from 1950 and recently released via the Freedom of Information Act, was said to pro-

vide the proof. "Look at the data, facts, and evidence. It's overwhelming," said Walt Andrus of Seguin, Texas, MUFON's director. The UFOs were said to be circular in shape, and 500 feet in diameter. No explanation was given for how the government somehow managed to dispose of the three circular craft, each almost as large in diameter as the Washington Monument is high, without anyone noticing anything suspicious. UFOs were also alleged to have landed at Kirtland Air Force Base in Albuquerque in 1980, but apparently managed to get away safely.

Finally, in May things really started to get serious. The *Albuquerque Tribune* reported on May 4, "Group Expects UFOs to Visit Kirtland in Next Few Days." The news article said: "Mutual UFO Network members will be watching the skies over Kirtland Air Force Base for the next few days after receiving a tip that extraterrestrials might be visiting. Walt Andrus, head of the Texas-based MUFON organization, confirmed today that his group is acting on the report that unidentified flying objects might land in Albuquerque as early as tonight." A tip, which according to Andrus came from someone outside MUFON, predicted that the aliens would land by Thursday, May 5. Unfortunately, the aliens failed to keep the appointment. When Saturday arrived and there was still no trace of any aliens, the *Tribune* published a cartoon making light of the whole affair.

Then came the May issue of *Omni* magazine, containing the story of a UFO encounter that had earlier received a great deal of attention in MUFON's *UFO Journal.* It was the photo taken by the Rev. Harrison E. Bailey, purportedly showing two aliens who had entered his home hiding behind Halloween masks. All that can be seen are the idiotic grins on the two masks and the aliens' "feet" sticking out from behind, looking amazingly like some kind of pantyhose hanging loosely down. While some MUFON officials argued that the whole thing was a crude hoax, Ann Druffel, MUFON's regional coordinator for Southern California, supported Bailey's tale. When it was pointed out that, despite Bailey's denial of using a flash to take the photos, the shadows clearly reveal that a flash was used, Druffel replied, "I think the light source was paranormal." Elsewhere, however, Druffel indicates that she may now be tempering her earlier enthusiasm for Bailey's account.

Lest anyone doubt, however, that MUFON is a "scientific" UFO organization, the *Dallas Times-Herald* of April 10 clarified that question, headlining "Texas-based UFO club not for 'crackpots.'" In it Andrus explained that membership in MUFON is by invitation only because "that's the only way to keep the crackpots out."

—Robert Sheaffer

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Creationist Pseudoscience

Scientific creationism is a classical pseudoscience in every way.

Robert Schadewald

> *The instructed Christian knows that the evidences for full divine inspiration of Scripture are far weightier than the evidences for any fact of science.*
> John C. Whitcomb and Henry M. Morris[1]

Scientific creationists consider the first chapters of Genesis the ultimate science textbook. They believe that the entire universe was created six to ten thousand years ago in six solar days. All earthly forms of life were specially created, and most of them perished in a global Deluge a few thousand years ago. The Deluge also laid down essentially all of the sedimentary rock on earth.

Many fundamentalists insist that these doctrines should be part of the public school science curriculum. In 1981, Arkansas creationists smuggled a bill through the legislature that would have forced public schools that teach evolutionary theory to give equal time to creationism, but it was thrown out by a federal court on January 5, 1982, after a challenge by the ACLU. The ACLU successfully challenged a similar law in Louisiana.

Pseudoscience

Scientific creationism is a classical pseudoscience, and it therefore differs from science in several fundamental ways. Essentially, science is an open system based on skeptical inquiry, and its ultimate appeal is to evidence. Scientists use inductive reasoning to formulate general laws from specific observations. A pseudoscience is a closed system based on belief, and its ultimate appeal is to doctrine. Pseudoscientists base their systems on

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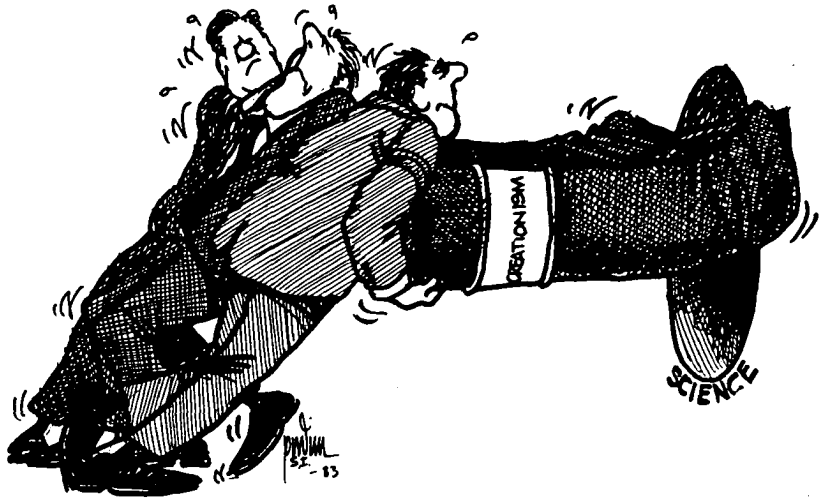
Robert J. Schadewald is a writer with special interests in certain fringe-science movements. He wrote on scientific creationism, geocentricity, and the flat earth in our Winter 1981-82 issue.



deductive logic, deducing how the universe must act to conform with their doctrines. As Whitcomb and Morris indicated in the opening quotation, when the scientific facts conflict with their interpretation of the Bible, then the facts be damned!

The standard work on pseudoscience is Martin Gardner's *Fads and Fallacies in the Name of Science,* originally published in 1952. The first chapter is a profile of pseudoscience and the pseudoscientific personality and has not been improved upon in thirty years. I will therefore limit my general remarks on pseudoscience, referring readers to Gardner's work for a fuller treatment.

Pseudoscientists are of two types. One group consists of ordinary "cranks," self-proclaimed geniuses who seem motivated by contempt for conventional scientists. George Francis Gillette, discoverer of a remarkable "backscrewing theory of gravity," was an excellent example. The other type of pseudoscientist seeks to justify some sort of ideology with scientific arguments. Examples of the latter range from Nazi anthropologists to scientific creationists. Both types of pseudoscientists harbor feelings of personal greatness.

The classic scientific crank is characterized by paranoia. He (rarely she) has unshakable faith in his own ideas and considers all who fail to share his vision blind and ignorant. Conventional scientists are dismissed as hollow authority figures who maintain their positions by parroting the "party line" and preserving the status quo. The crank frequently considers them not only venal, but intellectually dishonest. Indeed, their rejection of the crank's ideas proves their venality and dishonesty and demonstrates how they plot against him.

The greatness that the classic crank claims for his own genius, the religiously motivated pseudoscientist vests in his relationship with God. For instance, Henry M. Morris, founder of the Institute for Creation Research and America's foremost scientific creationist, believes that the Second Coming of Christ may be expected momentarily. Part of the Doctrinal Position of Morris's Christian Heritage College is a belief in the Rapture of the Church. Before the upcoming "Seven-Year Tribulation Period," the saved will be bodily snatched up to Heaven, leaving the unsaved rabble to a horrible fate.[2] Such beliefs can imbue one "chosen" with a personal exaltation that no earthly force can humble. Thus Morris believes that his opinions on virtually all scientific matters are superior to those of the vast majority of scientists (i.e., all those who reject his biblical literalism).

As for plots, Morris's belief system is dominated by a supernatural plot. His universe is literally haunted by Satan and visited by various forms of supernatural intervention. He has written, for instance, that the moon's craters may be scars incidentally inflicted on that body during a cosmic battle between the forces of Satan and the armies of Michael the Archangel.[3] He has also suggested in two of his books that Satan personally met with the Babylonian king Nimrod atop the tower of Babel to plot the theory of evolution.[4,5] Therefore when Henry Morris argues that evolution is Satanic and that scientists reject creationism because Satan has blinded them,[6] he's not speaking figuratively.

Pseudoscientists are characteristically blind to what they do not want to see. Ordinary cranks come by their irrationality through ignorance or personality defect. Many creation scientists, rather than being victims of crippled intellects, are self-mutilated. To accept the contradiction-riddled Bible as inerrant, they have schooled themselves in the art of finding reasons for whatever they want to believe. They have learned to ignore or rationalize away inconvenient facts, to avoid questioning (or even thinking about) key concepts, and to avoid pursuing lines of inquiry that threaten to contradict their received dogmas. In other words, they've trained themselves to shun the unfettered inquiry and hard-nosed skepticism that are the hallmarks of science.

Creation scientists therefore tend to fall naturally into patterns of thought and activity indistinguishable from those of ordinary cranks. Like secular cranks, they base their beliefs in exaggerted self-esteem and plot theories and maintain them by mangling logic and ignoring evidence. Personally, I find little to choose between the self-proclaimed "genius" and the self-proclaimed "humble instrument of the Almighty." The latter merely covers his delusions of grandeur with a cloak of false modesty. Indeed, I consider many scientific creationists merely garden-variety scientific cranks whose religious beliefs lead them to ride the creationist hobbyhorse rather than promoting (say) pushing gravity, the nonrotation of the moon, or the astronomical fantasies of Immanuel Velikovsky. I

emphasize, however, that this assumption is not necessary to explain the behavior of creationists.

Pseudoscientists frequently rely on the "if today ain't the 4th of July then it must be Christmas" mode of reasoning. That is, they throw rocks at conventional science and then pull their personal rabbit out of a hat as the *only alternative*. In keeping with this tradition, creationist books, lectures, and debate presentations consist mainly of criticisms of orthodox science, to which they add a liberal sprinkling of theology. (Before the unsaved public, creationists try to conceal the theology by removing overt references to God and the Bible.) Most of their criticisms of science are dreary reading; but when creationists try to construct alternatives, they sometimes become interesting. Their offerings, however, are a far cry from science.

Science is a method for seeking reliable knowledge about the natural world by forming and testing hypotheses. Pseudoscientists erect their hypotheses as defenses against the facts, and they rarely dare to submit them to meaningful tests. The simplest way to demonstrate that creationism is pseudoscience is to try to treat it as science by subjecting creationist hypotheses to obvious and straightforward tests. The Institute for Creation Research is creationism's foremost think-tank. In what follows, I examine ICR's best-known argument against biological evolution as well as several of the structures they have erected to replace conventional science. Presumably these are examples of the "creation science" that ICR wants taught in public schools.

Thermoapologetics

Duane Gish is vice-president of the Institute for Creation Research. A biochemist with a Ph.D. from Berkeley, he has for a decade been ICR's most skillful propagandist. On the evening of February 4, 1982, Gish headed up a panel discussion on creationism at Tulane University. At one point, he offered a favorite apologetic, arguing that the Big Bang theory of the universe violates the second law of thermodynamics. While his exact words at Tulane were not preserved for posterity, Gish has publicly made this argument numerous times, essentially as follows:

> We had that Cosmic Egg that exploded. Nothing operated on that Cosmic Egg from the outside of the cloud of hydrogen and helium. Nothing was brought from the outside. It transformed itself from that chaotic state. Certainly an explosion doesn't generate order. It generates chaos. And from that initial chaotic state, we have the highly ordered universe that we have today. Now, ladies and gentlemen, that is directly contradictory to the second law of thermodynamics.[7]

A discussion period followed the panel at Tulane. According to an account probably written by Gish:

> Most of the discussion was actually generated by two physical scientists from the Tulane faculty who were in the audience. They challenged Dr. Gish's claim that the Second Law of Thermodynamics contradicts the Big Bang theory of the origin of the universe, asserting that the universe has constantly been getting more disorderly since the Big Bang. Gish rejected this claim as an impossibility.[8]

Again, what the physicists said wasn't recorded, but they no doubt noted that, in thermodynamic terms, a relatively compact cosmic fireball at zillions of degrees is more "ordered" than our present, relatively cool universe, which is scattered over 15 billion light-years.[9] It is not surprising that Gish would reject this argument, for he has made numerous other remarkable statements about thermodynamics. On one occasion, he argued that equilibrium constants cannot vary with temperature, or else they wouldn't be called "constants."[10] (Equilibrium constants vary exponentially with temperature. Pressed about this later, Gish called it a "slip."[11] He later published a discussion of the following reaction:[12]

$$2CH_4 + NH_3 + 2H_2O \longleftrightarrow H_2NCH_2COOH + H_2O$$

He did not explain how 15 hydrogen atoms on the left side of the reaction become 7 hydrogen atoms on the right, nor how 2 oxygen atoms on the left become 3 on the right.

Gish also seems impressed by the classic 1978 paper of creationist David R. Boylan entitled "Process Constraints in Living Systems."[13] Boylan, dean of the College of Engineering at Iowa State University and Technical Adviser to the Institute for Creation Research, had previously written that "the Second Law has been particularly helpful in developing an apologetic against abiogenesis."[14] In "Process Constraints," he attempted to show that living systems require a certain "kind" or "quality" of energy that is "intelligence or ordered energy."[15] Such concepts are foreign to conventional thermodynamics, and another ISU scientist, John W. Patterson, challenged Boylan's thermodynamic arguments. In a blistering critique of the paper, Patterson charged that Boylan made a number of elementary errors, the worst being that perennial gaffe of beginning thermo students, trying to compute an entropy change for a system without first devising a reversible path.[16]

The editor of *Creation Research Society Quarterly* refused to print Patterson's critique,[17] but several creationists collaborated in developing an apologetic against Patterson. Essentially they argued that Patterson's criticism was misdirected, in part because Boylan was really discussing a Steady State Steady Flow (SSSF) system. Announcing this to Patterson, Gish stated categorically and repeatedly that Boylan's paper contained absolutely no errors.[18] The thermoapologists having at this point purchased new rope, Patterson broke off the private dialogue. In a subsequent paper alleging widespread creationist incompetence, he

pointed out that the entropy change in an SSSF system is zero *by definition.* "Hence," Patterson wrote, "Boylan's central result—i.e., his erroneous formula for the entropy change—should have come out identically zero (!) and not the nonvanishing sum whose limiting cases he discusses at great length."[19]

Meanwhile, in late 1981, the Creation Research Society published No. 1 in its new monograph series, a volume entitled *Thermodynamics and the Development of Order.* Chapter 2 is a popularized version of the Boylan paper with most of the fatal errors (the erroneous derivations) relegated to an appendix.[20] Chapter 4 is "The Origin of Biological Order and the Second Law," in which Duane Gish discusses the ersatz reaction quoted earlier. Where this little volume leaves thermoapologetics depends on your point of view. Gish and the others apparently see themselves reaching new heights of creation science. Conventional thermodynamicists also see them as elevated—and twisting in the wind.

Flood Geology

It is no accident that the foundation work of modern scientific creationism is *The Genesis Flood.* Flood geology is absolutely crucial to scientific creationism. Not only do creationists need the Flood to float Noah's Ark, but it is their only explanation for the geologic strata. The geologic column almost screams "ancient," but the creationists claim it is young. Furthermore, if conventional geology is correct then, whether by Darwinian evolution or some other means, various life forms appeared on earth sequentially over a long period of time. Thus, of the three major elements of scientific creationism, two of them (original special creation and young earth) are founded on the third. And a shaky foundation it is.

One of the many problems with Flood geology is that it cannot explain the distribution of fossils in geologic strata. In *The Genesis Flood,* Whitcomb and Morris attribute fossil distributions to a combination of habitat, victim mobility, and hydraulic sorting.

The habitat and victim-mobility apologetics go hand in hand. The argument is that creatures of the sea and seashore would be buried first, then slow-moving lowland animals like amphibians and reptiles, then faster and more mobile land mammals, and finally wily and speedy man would be swept from the mountaintops. This explanation, poor as it is for explaining animal fossils, fails entirely for plant fossils. We can test the hypothesis by asking about angiosperms (flowering plants). The earth's shorelines are covered by a tremendous variety of flowering plants, and none of them can run very fast. Thus we'd expect to find the flowering plants overwhelmed with the amphibians. Yet angiosperms appear suddenly in the early Cretaceous, along with mammals.

The hydraulic-sorting apologetic is much more outrageous. For objects of the same composition and shape, cross-sectional area is

proportional to the square of linear dimensions, while weight is proportional to the cube. Thus similar objects falling through a fluid medium are sorted according to size. If trilobites, for instance, were sorted hydraulically, we would find all large trilobites of a certain species low in the fossil record and all small ones higher. This follows directly from the hydraulic-sorting hypothesis. But it is decidedly not what we find. The hydraulic-sorting hypothesis fails the most elementary test, and it is difficult to see how Henry Morris, who flogs the public with his Ph.D. in hydraulic engineering, could fail to understand this.

Numerous other fatal flaws of Flood geology have been discussed elsewhere.[21,22] Because it is so absurd, creationists will do almost anything to avoid discussing Flood geology in public debates. In a debate at Tampa on September 19, 1981, Henry Morris refused to answer the devastating attack on Flood geology made by biologist Kenneth Miller. Morris claimed it was because he preferred to talk about the "key issue" (biological evolution), but even the creationists in the audience knew better.

The Flood Waters and Continental Zip

Creationists have a tremendous problem explaining where the Flood waters could have come from. The late George McCready Price, the Seventh Day Adventist theologian who for thirty years was the leading anti-evolutionary writer, opted for a tidal wave caused by a near-collison with an astronomical body. Older creationists appealed to comet tails and sudden, radical shifts of the earth's axis. Most scientific creationists follow the lead of the turn-of-the century Quaker Isaac Newton Vail, who theorized that the earth was once surrounded by a vapor canopy.[23] The collapse of this canopy supposedly caused Noah's Flood, and some creationists believe that a second canopy collapsed to cause *the* (as in *one*) Ice Age.

There are numerous and insuperable difficulties with a canopy. To mention three: (*a*) there are no reasonable conditions under which a vapor canopy containing most of the ocean's waters would be stable; (*b*) the condensation of such a canopy would release as much energy (latent heat) as the earth receives from the sun in two or three centuries; and (*c*) the tremendous pressure at the base of such an atmosphere would be fatal to virtually all forms of terrestrial life. Indeed, creationist Robert E. Kofahl, science coordinator of the Creation-Science Research Center in San Diego, examined several variants of the canopy hypothesis and concluded that "without miraculous supernatural intervention into the natural order. . . . they all are doomed to failure. They cannot be made to fit with the laws of physics or with the requirements for life on earth." Kofahl, however, was not concerned about the lack of a natural mechanism, since "God is not inadequate . . . for any need or circumstance."[24]

Despite the obvious contradictions, Henry Morris adopted the vapor

canopy as his source for the Flood waters, and he bases other apologetics on it as well. For instance, he suggests that Methuselah and other pre-Flood patriarchs achieved their extreme longevity because the canopy shielded them from the aging effects of harmful radiation.[25] Because the canopy hypothesis fails miserably without divine intervention, Morris and other ICR creationists avoid discussing it before the unsaved; but it is a hidden part of the "creation model" that they want taught in public schools.

One creationist not satisfied with a supernaturally supported canopy is Walter Brown, director of the Institute for Creation Research's Midwest Center in Wheaton, Illinois. A retired Air Force colonel with a Ph.D. in mechanical engineering from MIT, Brown has the kind of credentials and self-assurance that appeal to a creationist audience. As part of his ministry, he delivers daylong seminars entitled "In the Beginning . . ." In these seminars, Brown presents arguments he claims conventional scientists cannot answer. For example, he claims that coal could not have been formed in prehistoric peat bogs, since it takes at least five feet of peat to make a foot of coal and some coal seams are 100 feet thick. "Can anyone here imagine a peat bog 500 feet thick? I mean, it's ridiculous! How could the bottom layers *grow*?"[26] Frankly, a conventional geologist asked the latter question probably *would* be struck speechless. The same reaction might be evoked by Brown's solution to the problem of the Deluge waters, which might be called the Theory of Continental Zip.

Suppose the earth was originally created with an outer crust about five miles thick separated from a rocky inner core by a mile-thick layer of superheated water at 500° F. Suppose this superheated water broke through the earth's crust in the middle of the prehistoric continent conventional geologists call *Pangaea*. The crust ripped like a rotten seam, the rip extending nearly around the earth. The escaping superheated water flashed into steam, and the continuing steam explosion tore loose megatons of dust and rock and carried them high into the atmosphere. The blast set the two halves of Pangaea in motion, and they slid away from each other over the remaining water. When most of the water had escaped, the zipping continents braked to a halt. The braking action caused buckling in the areas that first began to drag, thus raising mountain ranges. Meanwhile, the escaped steam condensed and it rained for forty days and forty nights. The earth was flooded and the turbulent waters laid down most of the earth's present load of sedimentary rock, the sediments coming largely from material torn loose by escaping steam. Eventually the Flood waters ran off into the ocean basins, including the newborn Atlantic basin, which straddled the escape rift—the mid-Atlantic rift. The steam remaining in the atmosphere continued to fall as snow in the northern regions, causing a series of yearlong ice ages.

Any geologist who spends a few moments thinking about this Keystone Cops version of continental drift, which tries to compress tens of

millions of years into one year, will find numerous fatal objections. The most obvious comes from high school physics. At one of Brown's seminars, someone pointed out that his theory calls for releasing an enormous amount of 500° F water onto the earth's surface and into its atmosphere within a year. The energy must be conserved. Wouldn't things get unbearably hot? Brown said he hadn't tried to calculate what the effect would be, and he attempted to slough the objection off by claiming that the expanding steam would have a cooling effect. This offers at best temporary relief, since in condensing the Flood waters would again release their latent heat. Indeed, as I subsequently pointed out to Brown, just in cooling from 500° F to 212° F, the mass of water he hypothesizes would release roughly as much energy as the earth receives from the sun in a century. Brown admitted that this is a problem, but said his model has fewer difficulties than alternatives like the canopy.[27]

Brown's marvelous theory of continental zip illustrates the perils faced by a creationist who tries to construct a scientific explanation for dogma. Brown makes a great pother about scientific methodology, offering two predictions whose failure he says would falsify his theory. First, he predicts that large amounts of primeval water remain below the earth's major mountain ranges. Second, he predicts that efforts to measure continental drift rates will be futile.

The Age of the Earth

Scientific creationists insist that the earth and universe are only 6,000 to 10,000 years old. In his first book, *That You Might Believe,* Morris argued that the conventional time-scale is "ridiculous" because it is contradicted by the growth trend for human population. Morris noted that if the original population of the world was two, doubling it 30 times would produce the 1946 population of 2,160,000,000. Since the 1600s, the population has doubled roughly every century. Morris concluded that the doubling rate was incompatible with any evolutionary scenario. "If, on the other hand, all people are descended from Noah and his wife, who according to the best biblical chronology must have lived about 4,500 years ago, then the average interval for doubling is 150 years, which is entirely reasonable."[28]

It's hard to argue with that kind of logic. If a critic pointed out that, by this reasoning, the world population when the Great Pyramid was built must have been about 16, Morris would claim he was being ridiculed. Besides, Morris now has 69 other equally valid arguments against conventional geochronology, and he published all 70 in a laundry list in his 1977 book, *The Scientific Case for Creation.*[29] (This is still 30 fewer than flat-earther William Carpenter offered in *One Hundred Proofs that the Earth Is Not a Globe.*) To get an idea of the quality of the other arguments, consider the following example, based on a discussion by Dr. G. Brent

Dalrymple of the U.S. Geological Survey, Menlo Park, California.[30]

Ask a creationist for the best evidence that the earth is young and he or she will probably cite the decay of the earth's magnetic field. Thomas G. Barnes, the present head of ICR's Graduate School, developed this apologetic, and he has presented it at creationist conventions, in creationist periodicals, and in an ICR "technical monograph."[31] It is perhaps the creationists' most widely cited piece of "scientific research."

Barnes claims that the earth's magnetic moment has been measured reliably since about 1835 and that it is decreasing. He argues that the earth's magnetic field is generated by electric currents circulating in the earth's core, asserting that no mechanism (such as convection caused by radioactive decay) exists to sustain these currents. Barnes concludes that the earth's magnetic field must decay exponentially, and from data accumulated since 1835 he calculates a decay half-life of 1,400 years. He then argues that the earth cannot be older than about 10,000 years, since before that its magnetic field would have been unreasonably high. Typically, Barnes carefully avoids testing his hypothesis.

As it happens, the strength of the earth's magnetic field for the past several thousand years is well documented. Archaeologists have long used pottery styles and types to identify and date human habitation sites, and they have developed detailed and reliable pottery chronologies for many regions and cultures. Pottery is also of value to those studying paleomagnetism, for when fired pottery cools through a critical temperature (called the Curie temperature) it becomes permanently magnetized by the earth's field. By measuring the magnetic moments preserved in reliably dated pottery, specialists in paleomagnetism have reconstructed the history of the earth's magnetic field for the last several millennia. A recently developed and independent check on the pottery data is based on the moments preserved in mud bricks from historical sites.[32] Barne's hypothesis predicts that three half-lives (4,200 years) ago (when, according to Morris's "very reasonable" hypothesis, the human population was 16) the earth's magnetic field was eight times what it is now. The magnetic moments recorded in bricks and pottery from that era agree nicely: the earth's field then was slightly weaker than it is now.

Neither Barnes nor any other creationist has ever, so far as I know, acknowledged that such data exist. But Barnes's theory is not just flatly contradicted by the evidence. As Dalrymple pointed out, it is based on a hopelessly incorrect assumption.

Barnes essentially argues that the *total energy* of the earth's magnetic field is decaying with a half-life of 1,400 years, and the dynamo he hypothesizes to produce it would do just that. But the earth's magnetic field can be split into two components, the dipole and the nondipole moments. While the dipole moment is in fact decreasing, the nondipole moment is increasing at almost a matching rate, so that the total energy of the earth's magnetic field is decreasing hardly at all. This fatal fact, which

demonstrates that Barnes's scheme is unequivocally wrong, is discussed at length in the very book from which Barnes drew his data![33]

Creationist Astronomy

Perhaps the most outspoken critic of conventional science among the creationists is Harold S. Slusher of the University of Texas (El Paso) and the Institute for Creation Research. Slusher is also a foremost exponent of the conspiracy theory that holds that "evolutionists" conspire to suppress creationism. He has frequently accused conventional scientists of intellectual dishonesty and/or incompetence.[34]

Slusher has long claimed the title "Doctor" based on his honorary D.Sc. from Indiana Christian University. (ICU is a Bible College that, when I last checked, had a 1/2-man graduate science department, i.e., a professor of natural science *and* mathematics.[35]) He now boasts an earned Ph.D. from Columbia Pacific University, described by creationists as "a nontraditional university with two campuses in the Bay Area. The Graduate School is set up with a similar manner of operation to that of such European universities as the University of Vienna, the University of Bologna, and the Sorbonne (Paris)."[36] From the bologna about the Sorbonne and the universities of Vienna and Bologna, experienced creationist watchers will immediately (and correctly) infer that Columbia Pacific University is unaccredited.

Slusher is noted for championing the theory that light travels in highly curved Riemannian space and that the entire universe is actually only 15.7 (5 pi) light-years across. Even more remarkable is his discovery (published in his 1974 monograph, *A Critique of Radiometric Dating*) that the radioactive decay constant of the isotope iron-57 can be changed up to 3 percent under laboratory conditions.[37] In a recent, revised edition of this monograph, Slusher further claims that the decay constant of cesium-133 can likewise be altered.[38] Standard references unanimously agree that both isotopes are stable. (An iron-57 nucleus can exist in—and thus decay from—an excited state, but this decay has nothing to do with radiometric dating.)

Considering the foregoing, connoisseurs of pseudoscience would expect great things of a joint astronomical paper by Slusher and Barnes. In the December 1981 *Creation Research Society Quarterly,* they joined forces with G. Russell Akridge, formerly associated with Bob Jones University and now with Westminster Schools in Atlanta, Georgia. Akridge, who also teaches summer courses in astronomy at ICR's Graduate School, is author of several articles claiming that scientific speculations about decreases in the sun's diameter prove that the sun cannot be 5 billion years old. The Akridge-Barnes-Slusher paper, entitled "A Recent Creation Explanation of the 3°K Background Black Body Radiation,"[39] is a masterpiece of creation science.

The authors begin by asserting that the Big Bang theory cannot explain the 3°K background radiation. (This would surely have surprised the late George Gamow, who explicitly *predicted* the background radiation about 30 years before it was discovered.) They argue that, if such radiation were present initially, it would have escaped the universe long ago. (*Nothing* can escape a relativistic universe by any conventional means, and it's incredible that Akridge, Barnes, and Slusher, all three of whom have published articles about special relativity, do not seem to know that.) They also ridicule Big Bang theorists for basing their calculations on an expanding universe with finite volume and perfectly reflecting walls. (Cosmologists use this simple model instead of the rigorous relativistic equations because, within limits, it gives reliable answers with minimum hassle.)

But it is not the AB&S sins of omission and distortion that interest us here, but rather their pseudoscientific creation. After criticizing conventional theory, the authors offer their own explanation for the 3°K background radiation. They argue that the dust and gas of the galaxy were created at absolute zero and have been warming up ever since. According to their calculations, if the interstellar dust and gas have been warming up for about 6,800 years (roughly, since the traditional date for creation is 4004 B.C.), it should presently be at—surprise!—3°K.

Only an astronomer can properly appreciate the AB&S theory, but one contradiction is obvious to an informed layman. If the 3°K radiation came from dust and gas in the galaxy, its intensity would exhibit a strong maximum in the plane of the Milky Way, where most of the dust and gas are concentrated, and a minimum at the galactic poles. But (as AB&S state explicitly at the beginning of their paper) the intensity of the 3°K radiation is remarkably isotropic! Thus the AB&S theory fails the most obvious test imaginable.

Conclusions

The preceding examples of creation science came from the intellectual leaders of scientific creationism. Readers seeking more of the same should consult back issues of the *Creation Research Society Quarterly*, the *Bible-Science Newsletter, Acts & Facts/Impacts,* or any other creationist periodical. The *Creation Research Society Quarterly* especially provides a safe, slick-paper haven where creation scientists can publish their most bizarre rationalizations, confident that their colleagues will be too kind (or too blind) to insist that they subject their hypotheses to elementary tests. Because creationists refuse to test their hypotheses and accept the results, scientific creationism is a classical pseudoscience, and the gulf between it and mainstream science is unbridgeable.

Since they cannot win by the rules of science, creationists promote their doctrines by religious, political, and legal means. While Jerry Falwell

promotes creationism on television, thousands of other fundamentalist ministers push it from their pulpits; and many of them pay ICR propagandists to come into their churches and make presentations. The nation's largest Protestant denomination, the Southern Baptists, has officially endorsed the teaching of "creation science" in public schools.[40] They and other fundamentalists continually pursue this goal through legislation and school board action.

Scientific creationism is the best organized movement in the history of America pseudoscience, and thus the most dangerous. It is a dubious honor.

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The Project Alpha Experiment Part 2. Beyond the Laboratory

Some scientists learn from their errors, others refuse to. The press makes wild claims, a professed 'expert' fails the test, and the hoax is disclosed.

James Randi

In Part 1, James Randi told the story of the first two years of his Project Alpha experiment, in which two young magicians posing as psychics were introduced into the newly created McDonnell Laboratory for Psychical Research at Washington University, St. Louis, to test the scientists' ability to detect trickery. During these first two years they were able to pull off tricks nearly at will that impressed the researchers as psychic facts. Our story now resumes at a point after Randi showed lab director Peter R. Phillips evidence of trickery on the video tape of Shaw and Edwards being tested in the lab. —ED.

Upon returning to the McDonnell Lab, Alpha subjects Steve Shaw and Michael Edwards discovered that there had been big changes in the protocol. They called me in great excitement and announced that conditions were now such that they were unable to use simple trickery. In the fuse test, for example, they were no longer permitted to handle the test objects. In fact, there was now a cover over the fuse-holder, so manipulation had become impossible. Each fuse was marked with a distinctively colored lacquer and, when they tried to locate the source of that lacquer, they found that it had been locked up. As they described the changed conditions to me, I realized that Peter Phillips had initiated exactly the precautions I had suggested to him at our meeting in Syracuse.

I had suggested, for example, that the marking of items should be done on both a micro- and a macro-scale. This was the system I designed to be used when Chris Evans, David Davies, and I tested "psychic" Jean-Pierre Girard in France for *Nature* magazine. The cylindrical metal bars

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James Randi is well known to our readers. An internationally renowned magician, he has been actively investigating paranormal claims for the past thirty-five years.

Scientists are testing a 19-year-old psychic with dazzling mental abilities — he can bend metal, make objects move and generate an electric current using only the incredible power of his mind.

One of World's Best Psychics — At Age 19

Mike Edwards, a student at the University of Iowa, has been performing his amazing mental feats in tests at Washington University in St. Louis and at a psychic research laboratory in Oregon, Wis.

"He is certainly one of the strongest, most exciting psychics in the world," declared Prof. Walter Uphoff, a parapsychologist and psychic investigator who conducted the tests on Mike in Wisconsin.

"I would rate him with the world's best psychics. He has passed all kinds of stringent tests before 18 people, including metallurgists, physicists and psychiatrists.

"He bent metal that was in other people's hands, including a key and a piece of metal sealed in an envelope. A six-inch-long fork my wife was holding bent in her hands — an arch of about 40 degrees. And Mike never even touched it."

Other mental objects found Mike bent

AMAZING Mike examines a spoon he twisted with his mind.

ing his hand over it. He also boosted the electric current passing through a fuse so that the fuse blew out, just by focusing his mental energy on it, the amazing psychic said.

"I also bent a fork without even touching it, and the whole thing was recorded on videotape," Mike revealed.

Dr. Peter Phillips, professor of physics at Washington University, made a report on all of his experiments with Mike at an annual convention of parapsychologists at Syracuse University last August.

"We are encouraged by our work with him," Dr. Phillips told The [illegible]. "We want [illegible]

Article in *National Enquirer* about Mike Edwards, quoting Uphoff (January 19, 1982).

used on that occasion were boldly marked with variegated colored stripes running the length of each bar, applied with indelible felt-tip markers. Thus no substitution of bars was possible, and rotation along the major axis to reveal a previously attained bend—the means by which Girard usually accomplished his trick—would be immediately visible. Final identification of the samples was made by means of very tiny scratch marks made under high magnification, much like fingerprints. Girard completely failed this careful set of tests.

Upon hearing this report, I was elated, as were the boys. The McDonnell Lab personnel had listened to advice, and reformed accordingly. The fuse test was not the only thing that had been revamped. A totally different attitude prevailed at the lab. The boys felt that from then on they would have a difficult time getting around the protocol. But parapsychologists outside the McDonnell Lab were eager to involve the boys in psi-testing, and we were willing to accommodate them.

Actually, Steve and Mike had been visiting other investigators for some time while still involved at the McDonnell Lab. Two of them, Dr. Berthold Schwarz and Professor Walter Uphoff, are known to maintain high profiles in the media espousing any and all psychic wonders. Both were quoted rhapsodizing about Shaw and Edwards in the *National Enquirer,* while much more sober statements were given by the McDonnell Lab. When being interviewed by the *Enquirer* Edwards asked the reporter if he was really sure about the phenomenon he was writing about. Said the reporter: "Mike, I don't have to believe it. All I need is two professors to tell me it's true and I have a story!"

Schwarz produced a 51-page paper for the *Journal of the American Society of Psychosomatic Dentistry and Medicine* titled "Taming the Poltergeist," in which he reported on experiments conducted by him at his home and at the National Institute for Rehabilitation Engineering (NIRE) in Butler, New Jersey, using Steve Shaw as the subject. Actually,

Enlargements from single frames of 8 mm motion picture film shot by Steve Shaw. Psychiatrist Schwarz saw a woman's torso, breast, nipple, thigh, a baby being born, a female profile, a UFO, and a long-haired mustached man in these photos. Shaw produced the effect simply by spitting on the camera lens.

the experimenter was Shaw; Schwarz was the subject.

There are dozens of "experiments" described, laced with psychiatric observations attempting to explain why events occurred the way they did. Every creak, pop, movement, and unexpected event that took place—even after Shaw had left the scene—was attributed to his magical influences. And amid all this, Schwarz kept encouraging Steve to use his powers to heal the sick—especially a close relative of Schwarz. Steve tried everything he could to talk that person out of dependence on magic, but to little avail.

At one point, Steve was given an 8-mm motion-picture camera and was asked to shoot some film of Donald Selwyn, the director of NIRE. When it was developed, a strange amorphous "swirl" was found in the center of some frames, and psychiatrist Schwarz discovered in that swirl: some moving faces, a Jesus portrait, a UFO, a woman's torso, nipple, breast, and thigh, and even a baby being born! "The swirl," reported Schwarz, "followed Selwyn around the parking lot." Though no one there was able to figure out how these shapes had gotten on the film other than through paranormal means, Steve explained to me that he'd simply spat upon the lens!

It is interesting to quote from that study of Schwarz. Writing of those who would deny the validity of what he was describing and calling for dependable observers of these wonders, he said, ". . . it would be

desirable to have sophisticated conjurors and gentlemen . . . like W. E. Cox, [who] in addition to being a highly trained engineer is also a leading parapsychologist and expert conjuror. Consulting conjurors whose probity, ethics, and claims about themselves have not been verified and have seemingly sought publicity with poorly documented sensational charges and challenges should be avoided." I disagree with the first statement, but agree with the second; if Schwarz can produce such a person for me, I will personally tar and feather the scoundrel.

Both Uphoff and Schwarz depended upon William E. Cox, an amateur magician and enthusiastic psi devotee, for design of their security systems. Cox appeared at both the Syracuse ('81) and Cambridge ('82) Parapsychological Association conventions and showed his now-famous "SORRAT" (Society for Research in Rapport and Telekinesis) films in which a deck of "sealed" ESP cards is seen to emerge from its box, shuffle and sort itself, dance about, and return to the box. The whole farce took place inside a "sealed" aquarium (like the one used in the McDonnell Lab tests) that Cox designed and built. At both conventions, most of the parapsychologists were convulsed with laughter upon seeing Cox's circus. One shouted out, "Where's George Pal?"—a reference to the old "Puppetoon" animated films of a few years ago. It seems there is a point beyond which even dedicated parascientists cannot maintain belief.

John Thomas Richards, Ph.D., is the man behind SORRAT. While visiting in Phillips's lab along with the Alpha subjects, Richards had levitated a small, light folding table—and photographs were taken. One of them revealed a very prominent thumb (attached to Richards) under the edge of the table, a fact that was called to the attention of the lab personnel by the Alpha boys. The researchers mumbled a bit, but said nothing more about it. Richards is fond of producing "spirit raps" with his foot, and the Alpha boys found it a hilarious sight as learned people stared at the floor whereon Richards stood, their mouths agape, while thumps came from a clearly moving foot. On another occasion, a video-tape record showed Richards and his wife as they approached a spoon on the lab table, blocked it with their bodies, and walked away again. The spoon was seen to have developed a paranormal bend while shielded from view.

(On March 22, 1982, Phillips sent out a notice disclaiming any validation by the McDonnell Lab of events that took place there involving Richards. The SORRAT book clearly implies support of the McDonnell Lab for "miracles" that occurred within the "sealed" bottles Richards supplied for the Alpha boys to work with. He claimed that pipe-cleaners twisted themselves into human figures while Shaw merely stared at them from across the room. Needless to say, Shaw understands quite well just how the twisting took place. The "mini-labs" (bottles) designed and prepared by William E. Cox and declared by him to be foolproof were easily opened and re-closed.)

While being tested by another believer, Professor Otto H. Schmitt

This bottle top was "tightly twisted with Duco cement and sealed with wax" when given to Shaw to work on. The contents became "intricately involved" overnight, a circumstance parapsychologist Berthold Schwarz said seems "impossible under the circumstances for even if the top were unscrewed in some way without leaving evidence for breaking the seals, the internal diameter of 4.6 cm would make it difficult to form this configuration with the spoons." But Shaw merely unscrewed the top, bent the objects, and replaced the top—without the seals being broken.

of the University of Minnesota, the boys had an inspiration. Schmitt had supplied them with a few tiny, cheap digital watches—the type that are permanently sealed. He'd asked them to alter them paranormally. Mike sneaked one out of the lab and, while having lunch in a self-service restaurant during a noon break in the tests, he placed it inside his sandwich and stuck it in the microwave oven. As expected, the watch went crazy, displaying gibberish on its liquid-crystal readout. Professor Schmitt considered this to be a wonderful example of psychic force and marveled over it to the press.

Preceding the psychic picnic at Madison, Wisconsin, held by Walter Uphoff in the guise of a serious seminar, I received an inquiry from Tony Edwards, a producer for the BBC Science Features Department in London. He intended to conduct on-camera tests of psychokinetic metal-bending (PKMB) during the seminar and wanted me to design a proper protocol for him to use. I did so, and supplied a set of sealed acrylic tubes containing metal targets for the metal-benders to attempt to distort. The subjects were to be Mike, Steve, and Masuaki Kiyota, a highly-touted spoon-twister from Japan who was the major subject of Uphoff's ludicrous book *Mind Over Matter* (one of three books of that exact title in recent years!) and whose unpsychic talents were exposed by Christopher Scott and Michael Hutchinson (*SI*, Spring 1979). They were to be filmed at the Channel 21 PBS station in Madison. And I did not

inform my two colleagues how I had designed the tests; they had to do the best they could.

Producer Edwards followed my protocol exactly, and the results were predictable. So long as proper controls were maintained, zero metal-bending took place. None of the prepared samples changed shape, and Uphoff derided Tony's attitude. He complained that the atmosphere was "oppressive" and that psychic events could not possibly take place when conditions were so closely controlled. However, the BBC team was determined to obtain PKMB under strictly scientific conditions and was not persuaded by Uphoff to relax controls. When the tests were terminated, metal contorted left and right as I had predicted it would. (Girard, in France, had put in a measurable bend the very moment the experiment was officially ended and video coverage had terminated.) This only served to frustrate Tony, who had begun the project convinced not only that PKMB was a reality but that he could capture the beast on film.

Uri Geller, the former psychic superstar, was scheduled to appear at that Madison meeting and I wanted to see if he had any new wrinkles in his act. It had been a few years since I'd actually seen him in person, and then I was usually tucked behind the scenes in a studio, watching a TV monitor in a control room or at the sides of a darkened lecture hall, since Geller has always refused to perform when I am present. I determined to attend his performance in Madison, and to watch my two colleagues, who were also booked to appear there with Kiyota.

I sent off my check to Uphoff to register for the meeting. I never saw it again, nor did I receive any acknowledgment. But what I did get was a windy letter from his lawyer forbidding me from corresponding in any way with Uphoff, ever! Now such an injunction is certainly unenforceable—and very presumptuous. But I replied that Uphoff would never again hear from me in any way. I have kept that promise; Professor Uphoff has the right not to be informed.

But Uphoff did hear from an Adam Jersin of New Brunswick, New Jersey (not far from where I live!), who sent a postal money order to register for the meeting. He was accepted, and soon after that a man with a dyed beard, wearing dark contact-lenses, a reddish fright-wig, dreadful auxiliary dentures, a belly-pad, elevated cowboy boots, and a $7.00 suit from the Salvation Army store arrived among the strange assemblage at Madison in the company of a Moses Figueroa—a Punjab-like companion—and they blended right in.

Uphoff could have rearranged the letters of the name and come up with a different one, but the anagram got right by him. He not only greeted Jersin and autographed a book for him, but he continually directed him to various functions, since Adam seemed even more disoriented than the average person at the affair. I must admit that I lost a pound or two during those three days, since the protruding dentures made chewing impossible. I spent most of my mealtimes admiring miraculous anecdotes

delivered by my table-companions.

I rose early each day at Madison, so as to be assembled in my finery in time to take advantage of the myriad of wonders offered—all of which was to be culminated with an appearance by Geller himself. But small dramas were played out before that glorious event. During breakfast one morning, I chanced to sit beside my two young colleagues, who were dazzling Tony Edwards's secretary, a lady named Dee. She squealed in delight as each spoon bent and moved about, and managed to castigate that dreadful man Randi whenever the boys (not by accident, I'm sure) brought up my name.

During one spoon-bending session on stage featuring the boys and Masuaki Kiyota, I stood beside an ebullient Teuton who exclaimed, as he watched Michael Edwards stroking a slowly bending spoon, "Dis is de REAL ting! Oh, how I vish dat Randi vas here—he vould not believe it! He vould LAUGH at dis!" "Really?" I replied—and I laughed. I dared not catch Michael's eye, or we'd have broken up that session in a hurry.

During those few days, in addition to their previous encounters with Kiyota, the two boys had ample opportunity to witness his methods. Stocky, with short, strong fingers, the Japanese wonder has developed a method of putting a twist in the neck of a spoon that seems beyond the capability of an ordinary person using only his bare hands. It consists of first bending the spoon to a right-angle and then, by holding the bowl firmly, cranking the handle around. The resulting motion produces a tight twist and a return of the handle to an in-line position. Held with the fingers concealing the twist, the spoon looks unaltered, and Kiyota is known to have sat with an already-twisted spoon for long periods of time, massaging it and finally allowing the twist to come into view.

Finally it was time for the Geller show. Each person was carefully scrutinized at the door (and checked against known undesirables), and after gushing introductions the spoon-bender appeared, boyishly effervescent as always. He told the usual endless anecdotes about his childhood, innocence, validity, and indignation at doubters. The audience was enthralled, and I managed to applaud each and every remark, seated as I was in the front row immediately under Geller's nose.

The amateur benders, Steve, Mike, and Kiyota, were seated on stage with Geller, who mildly acknowledged them and then dismissed them so the really good stuff could begin. As he brazenly performed his obvious routines, I avoided the glances that my boys directed at me, shocked as they were at the blatant methods he used. He had lost, so it seemed, much of the smoothness he once had.

I will not go into details of how he performed except to say that it was quite standard and expected. Nothing new appeared, except that he made more excuses and denials than he might have previously. As he finished, I rushed onstage to have him autograph a copy of his book, which I now treasure as a trophy of that occasion. The World's Greatest Psychic

never knew whose hand he shook.

Just about that time, I became aware that Berthold Schwarz and a UFO-devotee from New Jersey were looking at me strangely. In the parlance of the trade, I knew they'd "twigged" me. With a quick word to Moses, who then ran interference for me, I left the area and headed for the hotel, where I doffed the disguise in my room.

Meanwhile, pandemonium ruled in the lobby. Moses stayed around to hear the scuttlebutt and reported that the consternation was intense. No one was really sure I was there, but they acted as if Martin Luther had been seen at the Vatican. Later, Uphoff was to hint that he'd known the truth all along, and I'd fooled no one. And pigs have wings.

Immediately following the Madison meeting, Steve and Mike took off for England. There they were interviewed by that epitome of careful research and reporting, London's *Psychic News,* which was bowled over. Miracles flew from their fingertips, and the paper gushed over their abilities—much as it had touted my own tricks as genuine when I'd visited its offices years ago and hoodwinked the staff in the guise of a psychic.

In their hotel in London, where I joined them while filming, the Alpha boys showed me a small transparent plastic box containing paperclips. It had been given to them by the McDonnell Lab, having been made up by a then unnamed parapsychologist who turned out to be George Hansen of the Institute for Parapsychology, in Durham, North Carolina. The object of this device was to see if Shaw and Edwards could bend the paperclips without opening the box. It occurred to me that there was a quality about paperclips that might serve us well. I stepped to the window for a moment and then returned the box to them with the clips linked together.

It had been rather simple. Anyone who works with these devices knows that they frequently become linked by accident. By jogging them about until one "nested" within the other, then rapping the box against

Randi with the linked plywood rectangular rings.

my hand to throw them against the end of the box, I'd gotten them to link. I told the boys to return the still-sealed box and await results. Though the intent of the experiment had been different from the result we obtained, Hansen described it as "quite impressive!" He has since said that he solved the mystery himself without having to invoke psychic powers.

Back in America, Shaw and Edwards were presented with a new challenge: linking rectangular plywood rings. William Cox had made a set of these rings and left them with Richards, who then "discovered" they had become mysteriously linked together while in his possession. Though such a trick is quite simple, it was looked upon as evidence of irrefutable psychic power at work—even though the rings, unlike those I produced for the boys to use, showed sizable cracks that rather gave them away. *Psychic News* challenged me to pay my prize of $10,000, not knowing that I was daily linking particle-board and plywood rings just for practice. Steve sent a set off to Walter Uphoff, who had remarked on this sort of miracle, "Here's something I'd like to see a conjuror do!" Anything to oblige, Walter.

Just as the excitement over the linked rings was building, it came time to tip Project Alpha for good. The McDonnell researchers had essentially recovered themselves by reversing rather positive convictions

they'd previously held, though personally and emotionally the personnel were still convinced of the validity of what they'd seen. As for the researchers outside the McDonnell Lab, there had been little hope that they would ever change their point of view, in spite of the evidence. Some people have been educated far beyond their intelligence.

As an example of just how strongly some self-appointed parapsychologists can rationalize their failures, Walter Uphoff—desperately trying to explain his fumbling following the exposure of Project Alpha in *Discover* magazine—stated that Steve and Mike really had psychic powers all along but were now lying in claiming that they had tricked him! To further display his confusion, he asked a reporter, "How do these kids *know* they're fakes?" The mind boggles.

Perhaps Berthold Schwarz expressed his misunderstanding of the whole affair best when he declared, "Randi has set parapsychology back 100 years!" Not so, Doctor. Mike, Steve, and I brought parapsychology into the 1980s—and if it cannot stand that atmosphere it must perish. The kind of work that validated the powers of the Alpha kids belongs in the Dark Ages, along with other Things That Go Bump in the Night. It is claptrap and deserves to be labeled as such.

If Project Alpha resulted in parapsychologists' (*real* parapsychologists!) awakening to the fact that they are able to be deceived, either by subjects or by themselves, as a result of their convictions and their lack of expertise in the arts of deception, then it has served its purpose. Those who fell into the trap invited that fate; those who pulled back from the brink deserve our applause.

From within the parapsychological community itself came enough positive, supportive comment to encourage us to believe that Project Alpha had attained its goal. It was described as, "splendid and deserved." It was called, "an important sanitary service," "commendable," "long-needed," and "worthwhile." Said one scientist, "If I were you, I would have tried something like this long ago." Researchers described their own work as "entirely too lax" and their controls as "not the tightest."

As for Edwards and Shaw, who spent more than 160 hours during four years of their lives cooperating in the experiment, I hope that my readers will join me in thanking them for their dedication and perseverance. As one of them said, "It had to be done." •

Join us for CSICOP's first international conference of scientists and skeptics.

SCIENCE, SKEPTICISM, and the PARANORMAL

October 28 and 29, 1983

State University of New York at Buffalo
Amherst Campus

FRIDAY
October 28

9:30–10:00 AM

Welcome

Paul Kurtz, CSICOP Chairman and Professor of Philosophy, SUNY at Buffalo

10:00 AM–12:30 PM

The Evidence for Parapsychology

Moderator: **Irving Biederman**, Professor of Psychology, SUNY at Buffalo

Panelists: **James Alcock**, Professor of Psychology, York University, Toronto, Canada; **C. E. M. Hansel**, Professor of Psychology, University of Wales, United Kingdom; **Robert Morris**, Senior Researcher, Computer and Information Sciences, Syracuse University

12:45–1:45 PM

Lunch Break

2:00–5:00 PM

Paranormal Health Cures

Moderator: **William Jarvis**, Professor of Health Education, School of Allied Health Professions, Loma Linda University

Panelists: **Stephen Barrett**, M.D., Chairman of the Lehigh Valley Committee Against Health Fraud, Allentown, PA; **Lowell Streiker**, Ph.D., Executive Director of the Freedom Counseling Center, Burlingame, CA; **Rita Swan**, Professor of English, Morningside College, and President of Children's Healthcare, Sioux City, IA

5:30–8:00 PM

The State of Belief in the Paranormal World-wide
(Reception and Dinner Meeting at the Buffalo Marriott Inn. Reservations required.)

Moderator: **Paul Kurtz**, CSICOP Chairman and Professor of Philosophy, SUNY at Buffalo

Panelists: **Mario Mendez Acosta**, Mexico; **Henry Gordon**, Canada; **Piet Hein Hoebens**, Holland; **Michael Hutchinson**, Great Britain; **Michel Rouze**, France; **Dick Smith**, Australia

8:30–10:30 PM

Project Alpha: Magicians and Psychic Phenomena

Moderator: **Kendrick Frazier**, Editor of *The Skeptical Inquirer*

Panelists: **James Randi**, magician and author; **Michael Edwards**, magician and participant in Project Alpha; **Steven Shaw**, magician and participant in Project Alpha

SATURDAY
October 29

9:30 AM–12:00 NOON

Parascience and the Philosophy of Science

Moderator: **Daisie Radner**, Associate Professor of Philosophy, SUNY at Buffalo

Panelists: **George O. Abell**, Professor of Astronomy, University of California at Los Angeles; **Mario Bunge**, Professor of Philosophy, McGill University, Montreal, Canada; **Stephen Toulmin**, Professor of Social Thought and Philosophy, University of Chicago

12:15–1:45 PM

SUNY at Buffalo Faculty Reception and Luncheon (Reservations required.)

2:00–4:30 PM

Why People Believe: The Psychology of Deception

Moderator: **Ray Hyman**, Professor of Psychology, University of Oregon at Eugene

Panelists: **Daryl Bem**, Professor of Psychology, Cornell University; **Victor Benassi**, Associate Professor of Psychology, University of New Hampshire; **Lee Ross**, Associate Professor of Psychology, Stanford University

5:30–7:30 PM

CSICOP Fellows' and Scientific Consultants' Dinner Meeting (By invitation only.)

8:15–10:30 PM

Animal Mutilations, Star Maps, UFOs, and Television

Moderator: **Philip J. Klass**, Senior Editor, *Aviation Week and Space Technology*

Panelists: **Ken Rommel**, former investigator, Federal Bureau of Investigation (FBI); **Robert Sheaffer**, leading UFO investigator

Exerpts from UFO "abductee" Betty Hill's appearance on the television program "Lie Detector" (on which she took a polygraph test) and Linda Moulton Howe's KMGH-TV documentary on animal mutilations will be shown during this session.

This conference is sponsored by the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) and cosponsored by the Department of Philosophy (SUNY at Buffalo) in cooperation with the departments of Psychology, Biological Sciences, Geological Sciences, and Anthropology.

The registration fee for the conference is $60.00. Meals and accommodations are not included. For an additional fee, those interested can join a bus tour of the Niagara Falls area on Sunday morning, October 30. The tour will visit points of interest on both the American and Canadian shores of the Falls. (Check with your local Canadian Consulate General's office to determine what documents you will need to cross the Canadian-U.S. border if you plan to take this tour.)

Attendance is by preregistration only. Registration forms and accommodations information will be sent in a separate mailing. For further details, please contact Mary Rose Hays, CSICOP, P.O. Box 229, Central Park Station, Buffalo, NY 14215, (716) 834-3222.

Forecasting Radio Quality by the Planets

An analysis of 18 years of Nelson's daily forecasts shows that the planets perform no better than chance.

Geoffrey Dean

For more than 30 years former RCA propagation analyst John Nelson has claimed that planetary positions correlate with the quality of shortwave radio propagation and that they can be used to improve the accuracy of propagation forecasts. According to Nelson, whenever the planets are in certain angular configurations they affect the sun's activity, which affects the ionosphere, which in turn affects radio quality.

Nelson's claims are supported by numerous published works,[1] and they are based on what one might suppose to be the best grounds of all, namely, a lifetime of professional experience in propagation problems with the world's largest shortwave radiocommunications organization. Thus by 1978 Nelson could say, "I have used this system quite successfully for more than 25 years and the fact that it works is beyond dispute," adding, in the best of engineering traditions, "but the explanation of why it works has eluded me."[2]

Unfortunately, none of Nelson's works contain controls or statistical analyses; hence it is impossible to evaluate what is supposed to be happening. And until fairly recently Nelson has never clearly stated the rules on which his forecasts are based.[3] As a result the field has taken on all the qualities of a belief system.

Believers include: (1) Nelson, who suggests that the high accuracy of his forecasts is ample support for his claims, (2) RCA, who obviously found his methods useful, (3) *73 Magazine,* a popular U.S. ham radio magazine that has published Nelson's daily forecasts since at least 1966 (in ham radio "73" is a popular abbreviation for "best regards"), and (4) astrologers, who have widely cited his work in support of astrological

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ideas (I have done this myself).

Nonbelievers include: (1) most scientists, who point out that solar-planetary relationships have been studied for decades without revealing any convincing evidence that the planets could have the effect claimed by Nelson, (2) the Space Environment Services Center (commonly known as the solar flare forecast center) in Boulder, Colorado, which checked his forecasts and did not find them useful,[4] and (3) readers of this journal, who are of course automatically skeptical of any claims presented without adequate supporting evidence.

What makes the situation interesting is that both planetary motion and radio propagation, unlike UFOs and Bigfoot, are quantified, unemotional, and largely understood. In other words Nelson's claims present us with a near-paranormal situation that should be capable of quick resolution.

The Plot Thickens

However, after 30 years there has been no sign of a quick resolution. What little debate exists has been centered on side issues. For example, a total of three studies have concluded that the apparent correlation between propagation quality and planetary positions can be explained as a statistical artifact.[5-8] This tells us nothing about whether Nelson's method actually works. Furthermore, a genuine planetary effect would produce the same results; hence unambiguous judgment is not possible.

Fortunately, in 1981 David Nias came to the rescue by comparing Nelson's forecasts with what actually happened.[9] His data consisted of Nelson's daily forecasts for RCA during 1964–1965, which Nelson had kindly provided from his files, the observed daily propagation quality across the North Atlantic for the same period, Nelson's daily forecasts for *73 Magazine* during 1979–1980, and the corresponding daily geomagnetic indices.[10]

If Nelson's claims are correct then the correlation between forecast and outcome should be positive for propagation quality, negative for geomagnetic indices (which are scaled in the opposite direction), and significant. But Nias found that the correlation was neither consistent nor significant. Thus for propagation quality during 1964–1965 the correlation coefficient ranged from -0.08 to 0.24 depending on year and time of day, mean 0.06 (significance level $p = .27$ for 332 degrees of freedom), and for geomagnetic activity during 1979–1980 it was -0.04 ($p = .39$, $df = 455$).[11]

Nias also found that Nelson's high accuracy could be explained by the low base rate of days with poor propagation, i.e., by the same artifact that gives high accuracy to forecasting sunshine in desert areas.

Unfortunately Nias analyzed less than 10 percent of Nelson's published forecasts and used no controls; hence some doubt remains. In an

attempt to settle the matter, I have subjected 18 years of Nelson's daily forecasts and the relevant solar-terrestrial records to exhaustive computer analysis, have consulted (usually in person) propagation experts and the few independent investigators of Nelson's methods in Australia, the U.S.A., the U.K., and Holland, and over several years have exchanged more than 20 letters with Nelson himself. What follows are a few highlights from the results, which are given in detail elsewhere.[12]

The Database

The data used in the analysis were as follows:

1. Daily forecasts made by Nelson for *73 Magazine* during 1966–1982. The forecasts are on the 3-point scale Good-Fair-Poor and were generally made 2 to 3 months in advance. They were analyzed by putting Good = 3, Fair = 2, and Poor = 1, which is scaled in the same direction as propagation quality.
2. Daily forecasts made by Nelson for RCA during 1964–1965 kindly made available by Nias. The forecasts are on a 6-point scale and were converted to the 3-point scale using a conversion that gave a distribution matching that of the magazine forecasts.
3. The corresponding indices of propagation quality, usually for the North Atlantic circuit because Nelson considers this to be the circuit most relevant to testing his forecasts, and geomagnetic Ap indices.[12] These were obtained from standard U.S. government publications.[13]
4. Control forecasts, which were simply the indices one solar rotation (27 days) previously. Such a forecast relies on the tendency for radio disturbances to repeat after 27 days as the solar rotation returns long-lived activity to the center of the solar disk. This tendency (and hence the accuracy of the forecast) varies greatly with solar phase, being greatest at minima and negligible at maxima, but for the present purpose this is of no consequence.

(1) and (2) combined give a total of 5,507 daily forecasts for the period February 1964 through August 1982, or 81 percent of the maximum possible. The difference from 100 percent is due to missing forecasts (mostly in 1967 and 1968) and changes in the records of propagation quality during which the continuity necessary for analysis was lost.

For the purpose of analysis the data were grouped into ten periods that best avoided discontinuities within each period. The number of daily forecasts in each period ranged from 334 to 943.

The Accuracy of Nelson's Forecasts

According to Nelson the average accuracy of his forecasts "has been close to 90 percent for the past 12 or 15 years," i.e., from the mid-1960s

onwards.[13] He also claims that such accuracy is possible only by using planets as part of the forecasting mix.

We have seen that Nias has explained the high accuracy as an artifact of the method of calculation, whose details fortunately need not concern us here. What Nelson doesn't tell us is that U.S. government forecasts from 1964 through 1969, when the procedure changed, consistently averaged 97–98 percent accuracy when assessed by the same method, or considerably better than his own.

The government forecasts were made 1 to 7 days in advance, which is much less than Nelson's lead time of 10 to 90 days, but they did not involve planets. This alone is sufficient to negate Nelson's claims.

Not only did the U.S. government publish their forecasts, they also published a monthly analysis of their accuracy, and all in the same place as their indices of propagation quality, which Nelson would necessarily know about.[14] Hence each month he would in effect be reminded that his claims were simply not true. However, such an inconvenience is not even hinted at in any of Nelson's works.

Nias points out that the method used by Nelson for assessing accuracy is useless because it provides no baseline against which the forecasts can be compared. This problem can be avoided by using the conventional statistical technique of correlation analysis.

Correlation Analysis of Nelson's Forecasts

A correlation analysis compares forecasts with what happened and tells

TABLE 1. Correlation between Propagation Forecast and Outcome

The table gives values of the product-moment correlation coefficient. For valid forecasts they should be positive for propagation indices and negative for geomagnetic indices. The correlation required for significance at the .05 level depends on the number of days in the period (mean 551, range 334–943) and is typically ±0.08.

Index	Forecast	Correlation		No. of periods
		Mean	Range	
Propagation	Nelson	.01	−.05 to .07	10
	Control	.30	−.01 to .58	8*
Geomagnetic	Nelson	−.00	−.06 to .08	10
	Control	.24	−.04 to .50	8*

* Control forecasts could not be generated for two periods because there were gaps in the data.

us how useful they are. If there is no significant correlation it means that the forecasts are effectively useless. A correlation analysis between the observed propagation conditions and the Nelson and control forecasts gave the results shown in Table 1.

In Table 1 the results for the control forecasts vary with solar phase as expected, but overall the correlation between forecast and outcome is in the right direction and highly significant, p for the mean correlation being 10^{-8}. By contrast the results for Nelson's forecasts are erratic, close to zero, and not significant, p being typically 0.5, which is as expected if the planets have no effect.

Varying the circuit, time of day, and interval between forecast and outcome to accommodate possible sun-Earth delays, made no difference. Nelson's forecasts remained stubbornly nonsignificant.

Because the distribution of Nelson's forecasts is skewed, being 58 percent Good, 30 percent Fair, and 12 percent Poor, it could be argued that the resulting correlations may be biased. This problem can be avoided by regression analysis.

Regression Analysis of Nelson's Forecasts

A regression analysis between the observed propagation and the Nelson and control forecasts gave the results shown in Table 2. These analyses differ from the previous correlation analyses in that the data are examined

TABLE 2. Variation of Outcome according to Forecast

For valid forecasts the propagation and geomagnetic means should respectively decrease or increase as the forecast goes from Good to Poor.

Source of Forecast	Criterion	Forecast			Mean SD†
		Good	Fair	Poor	
Nelson	Mean propagation index	6.00	6.02	5.94	1.1
N = 5,507	Mean geomagnetic index	13.69	13.75	13.86	13.6
	Number of forecasts	3197	1662	648	
Control*	Mean propagation index	6.21	5.40	4.90	1.3
N = 2,842	Mean geomagnetic index	13.09	16.09	20.45	14.5
	Number of forecasts	1810	633	399	

* Forecast is the rounded propagation index 27 days before, and is interpreted in the standard way. (Solar-Geophysical Data, monthly bulletins 1964 through 1982. National Geophysical and Solar-Terrestrial Data Center, U.S. Dept. of Commerce, Boulder, Colo., formerly CRPL F Series, Part B, Geophysical Data.) Sample is for 1970–1979, which is the longest period for which the propagation indices are sufficiently continuous.

† SD = standard deviation.

after being grouped according to forecast, thus preventing the less frequent forecast (which is where the interest lies) from being swamped.

The results of Table 2 show that the control forecasts vary in the right direction, the slope being about 30 percent of the maximum possible. By two-tailed *t*-test the differences between forecast means are all highly significant at the 10^{-5} level or less. (The term "two-tailed" means that no assumptions are made about the direction of the differences. This is the preferred way to apply the *t*-test.)

By contrast the variation of the Nelson forecasts is inconsistent. Only for the geomagnetic means is the variation consistently in the right direction, and even then the slope is only about 1 percent of the maximum possible. By *t*-test no difference is significant at the 0.10 level.

In other words, it makes little difference what Nelson forecasts, because the outcome is much the same. On this basis his forecasts are less than useful.

It could be argued that the propagation and geomagnetic indices are at best such a crude measure of propagation quality that any planetary effect would be lost among the resulting confusion. This problem can be avoided by considering only extreme days, which in effect is what Nelson does.

Analysis of Extreme Days

Nelson supports his claims by examples of planetary configurations that coincided with severe radio disturbances, some of which are undeniably impressive.

However, Table 2 shows that the number of Poor (i.e., severe disturbance) forecasts that actually turn out correct is about 1 to 2 percent of all forecasts. Hence each year by chance alone there will be a handful of good examples to support his claims. And with 40 years to choose from it is not surprising that some of these examples will be impressive.

Nelson terms one such example his Rosetta Stone because it "unlocked the secrets of the solar system."[15] The occasion was the greatest radio blackout in history, for which the worst days were 24 and 30 March 1940; and according to Nelson the planetary configurations during this period were spectacularly bad.

However, what Nelson doesn't tell us is that, according to his rules, a far worse configuration existed only ten days earlier, on 14 March 1940. But on that day, and for four days on either side, the radio quality as reported by RCA was uniformly good.[16]

Similarly, on 25 September 1909 the worst geomagnetic storm on record produced aurorae visible at the equator but was accompanied by quite unexceptional planetary configurations.

To check these findings, computer-generated planetary configurations for each day during 1964–1980 were examined to find the 12 days

TABLE 3. Propagation Quality on Extreme Planetary Days

If planetary positions correlate with shortwave radio quality, then the propagation quality and geomagnetic index on days with no disturbing planetary configurations should be significantly higher or lower, respectively, than on days with extremely disturbing configurations. In each case the sample consists of the 12 most extreme days from 1964 to 1980.

Criterion	Level of planetary disturbance	Mean	SD	p by two-tailed t-test
Propagation quality	Nil	6.6	1.4	.15
	Extreme	5.8	1.2	
Geomagnetic index	Nil	11.3	11.5	.70
	Extreme	12.9	9.6	

that, according to Nelson, should have been the most disturbed, and the 12 days that should have been the most undisturbed. This maximizes the difference between conditions and hence maximizes the chance of detecting planetary effects. The results are shown in Table 3.

The differences in Table 3 are in the direction that supports Nelson's claims but by t-test are not significant. Similar analyses of the planetary configurations for the best and worst radio days over different phases of the solar cycle, for the quietest and most disturbed geomagnetic conditions, and for days with and without outstanding solar flares failed to find support for Nelson's claims. In fact none of the differences were in the right direction.

For completeness, astrological factors in general were also analyzed—namely, heliocentric sign positions, aspects, and midpoints for planets taken individually and in combination. The analysis involved the best 3 percent and the worst 3 percent of radio days during 1969–1980 in two replicate sets of 60 pairs each. No factor was found that consistently discriminated between the best and worst days.

Conclusion

Exhaustive analysis of 18 years of Nelson's daily forecasts has failed to find any evidence to support his claim that planetary positions correlate with shortwave radio quality.

The methods used are clearly valid because they give positive results when applied to control forecasts.

Therefore, the conclusion is that planetary positions do not correlate with shortwave radio quality. The support Nelson's claims previ-

ously gave to astrological ideas consequently disappears.

This does not of course exclude the possibility that planets could affect the sun in ways other than those claimed by Nelson.

Acknowledgments

John Nelson responded over several years to countless queries. Helpful discussion and data were provided by Robert Knight (Perth, Western Australia), Leo McNamara (Ionospheric Prediction Service, Sydney, N.S.W.), Wim de Graaff (Utrecht), David Nias (London), and Howard H. Sargent III (Space Environment Services Center, Boulder, Colo.). 73 Inc. (Peterborough, N.H.) provided copies of Nelson's forecasts from issues of *73 Magazine* not available elsewhere. Colin James III (Denver, Colo.) computer-generated daily planetary data and configurations. This study was supported in part by a travel grant from the Colorado Astrological Society, Inc., which allowed a visit to U.S. personnel and data centers in September and October 1981.

Notes

1. A bibliography of Nelson's works is given in *Cycles,* April 1981, page 77. It lists 15 articles, 2 books, assorted letters and talks, but excludes articles in *73 Magazine* and astrology magazines.

2. J. H. Nelson. *The Propagation Wizard's Handbook.* Peterborough, N.H.: 73 Inc., 1978. The rules for predicting a disturbance are summarized on pages 102-04, with relevant comments scattered throughout the rest of the book. No references or index.

3. See Note 2.

4. Quoted by George Abell in G. O. Abell and B. A. Singer (eds.), *Science and the Paranormal.* New York: Scribner's, 1981, pp. 91-92. This quote was confirmed by SESC personnel during my visit in September 1981. Unfortunately their findings were never published because of pressure from other work.

5. A. Hunter. A supposed correlation of radio disturbance with planetary positions. *Journal of the British Astronomical Association,* 62, 194-96 (1952).

6. P. A. Ianna and C. J. Margolin. Planetary positions, radio propagation and the work of J. H. Nelson. SKEPTICAL INQUIRER, 32-39 (Fall 1981).

7. J. Meeus. On the correlation between radio disturbance and planetary positions. SKEPTICAL INQUIRER, 30-33 (Summer 1982).

8. J. H. Nelson. Shortwave radio propagation correlation with planetary positions. *RCA Review,* 26-34 (March 1951). The article that started it all. Describes very clearly how Nelson's ideas originated and is the only article to give the data criticized in references 4-6.

9. D. Nias. Storms in the ionosphere—a re-appraisal of Nelson's work. *Correlation,* 1, 2, 37-40 (1981). Nelson's reply and Nias's rejoinder appear in the next two issues. The same results are presented in H. J. Eysenck and D. K. B. Nias. *Astrology: Science or Superstition?* London, Temple Smith, 1982, pp. 155-56. The results of mine referred to as unpublished appear in updated form in reference 11.

10. Geomagnetic indices are relevant here because a geomagnetic storm indicates the existence of an ionospheric storm and hence of poor propagation conditions. They also provide a useful alternative to indices of propagation quality, which are usually based on signal strength and do not take into account fading and noise. For this reason Nelson suggested to me in October 1981 that the geomagnetic Ap index is the more satisfactory measure for evaluating his forecasts.

11. Nias and I inadvertently scaled Nelson's forecasts from *73 Magazine* in opposite directions; hence I have reversed the sign of his geomagnetic correlation to make it comparable with mine. Data not in note 8 comes from David Nias, personal communication January 1981.

12. G. Dean. Shortwave radio propagation non-correlation with planetary positions. *Correlation,* 4-37 (May 1983). A detailed analysis with 40 references. *Correlation* is devoted to scientific research in astrology and is available from 98 Hayes Road, Bromley, Kent BR2 9AB, England.

13. See Note 2.

14. The index of propagation quality varies according to circuit and how it is measured, but as a guide 7 = Good and 3 = Poor. Ap has an extreme range of 0–400 and averages ≤ 10 for about half the time. Very roughly $Ap \leq 15$ = Good and $Ap \geq 30$ = Poor. The correlation between the propagation index and Ap is reasonably high and averaged -0.54 for the 18 years of the present study.

15. See Note 2.

16. See Note 2. ●

Reduction in Paranormal Belief Among Participants in a College Course

A course emphasizing a critical scientific approach can reduce belief in paranormal claims.

Jerome J. Tobacyk

Several investigators have expressed concern about an increase in paranormal belief during recent times and have speculated about possible harmful consequences of such belief (Alcock 1981; Bainbridge and Stark 1981; Marks and Kammann 1980). This concern is clearly warranted, since history provides many illustrations of how certain paranormal beliefs have crystallized into ideologies destructive to individuals and society, indeed sometimes to human life itself (e.g., witchcraft, Nazism, the Jonestown case, etc.). Further, evidence from the psychological domain links certain paranormal beliefs, such as witchcraft, superstition, and spiritualism, with less critical inference-making, greater dogmatism, and greater endorsement of irrational beliefs (Tobacyk and Milford 1983). Thus there is evidence that certain paranormal beliefs are associated with less effective cognitive functioning.

Therefore, empirical study of the effects of courses that critically examine the paranormal belief of participants is quite important. This report concerns the effects on self-reported paranormal beliefs of participants of a ten-week college course that critically examined claims of the paranormal.

The course orientation was a scientific examination of evidence for claims of the paranormal. The text used was *Paranormal Borderlands of Science* (Frazier 1981). The course was primarily in a lecture format, with most of the material taken from: *Anomalistic Psychology* (Zusne and Jones 1982), *Occult and Supernatural Phenomena* (Rawcliffe 1952), *ESP and Parapsychology: A Critical Re-evaluation* (Hansel 1980), *Parapsychology: Science or Magic* (Alcock 1981), *The Psychology of the*

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Psychic (Marks and Kammann 1980), and *Science and Unreason* (Radner and Radner 1982).

Seventeen students were originally enrolled, although complete data were obtained from only 11 (7 males and 4 females; Mean (X) age = 20.3 years, SD = 2.4) due to class absences and course attrition. Five were majors in psychology, 3 in sociology, 2 in engineering, and 1 in English. The Belief-in-the-Paranormal Scale (Jones, Russell, and Nickel 1977), used as the paranormal-belief assessment instrument, was administered twice, once during the first class meeting (pre-test) and again during the last class meeting (post-test). No attempts were made to specifically cover the contents of this scale in class. This self-report scale (see Table 1) consists of 25 items concerning paranormal beliefs that are answered using a 5-point rating scale, with the points on the scale ranging from "1," corresponding to "strongly disagree with statement," through "3," corresponding to "undecided or don't know," to "5," corresponding to "strongly agree with statement." The Belief-in-the-Paranormal Scale is scored for each respondent by totaling the numerical ratings of each of the 25 items. Thus full scores on this scale can range from a "low" score of "25" (obtained by a person who strongly disagreed with all of the paranormal beliefs), to a "high" score of "125" (obtained by a person who strongly agreed with all of the paranormal beliefs), with a score of "75" representing the midpoint of the rating scale. Scores for each individual item can range from a "low" score of "1" to a "high" score of "5," with "3" representing the midpoint of the rating scale.

A series of t tests compared the pre-test scores to the post-test scores for the Belief-in-the-Paranormal Scale full scores, as well as for each of the 25 scale items. A significant t statistic, indicated by a probability (p) level less than ($<$) .05, shows which items showed a statistically significant pre-test to post-test decrease in reported belief. Table 1 lists the mean pre-test scores, mean post-test scores, t statistics on the pre-test and post-test scores, and probability levels for the full Belief-in-the-Paranormal and for each of the 25 items.

As indicated in Table 1, the mean Belief-in-the-Paranormal Scale full scores showed a statistically significant decrease from pre-test ($X = 77.9$) to post-test ($X = 59.9$). An inspection of the 25 items shows the nature of these changes. Twenty-four of the 25 items showed a change in pre-test and post-test scores reflecting lesser belief. Only item 8 ("Through psychic individuals it is possible to communicate with the dead") showed the same pre-test and post-test scores ($X = 2.4$). Of the 24 items showing decreases in reported paranormal belief, the amount of the decrease was statistically significant ($p < .05$ or smaller) for 7 items (items 1, 4, 11, 15, 16, 20, 24). Three other items (items 3, 10, 23) showed trends ($p < .10$ or smaller) indicating a decrease in belief from pre-test to post-test approaching statistical significance.

Of the 7 items showing significant pre-test to post-test decreases in

TABLE 1

Mean Pre-test, Mean Post-test and *t* Statistics for the Total Belief in the Paranormal Scale and for Each of the 25 Items

	Mean Pre-test Score	Mean Post-test Score	*t* Statistic	*p*<
Belief in the Paranormal Scale Full Score	77.9	59.9	3.00	.008
1. I believe psychic phenomena are real, and should become a part of psychology and be studied scientifically.	3.6	2.4	2.78	.02
*2. All UFO sightings are either other forms of physical phenomena (such as weather balloons) or simply hallucinations.	2.4	3.0	−1.29	ns
3. I am convinced the Abominable Snowman of Tibet really exists.	2.7	2.0	2.03	.06
4. I firmly believe that ghosts or spirits do exist.	3.3	2.3	2.45	.03
5. Black magic really exists and should be dealt with in a serious manner.	2.4	1.9	1.03	ns
6. Witches and warlocks do exist.	2.5	1.7	1.53	ns
*7. Only the uneducated or the demented believe in the supernatural and the occult.	1.3	1.8	−1.35	ns
8. Through psychic individuals it is possible to communicate with the dead.	2.4	2.4	0.0	ns
9. I believe the Loch Ness monster of Scotland exists.	2.3	2.0	<1.0	ns
10. I believe that once a person dies his spirit may come back from time to time in the form of a ghost.	3.0	2.2	1.77	.10
11. Some individuals are able to levitate (lift objects) through mysterious mental forces.	3.4	2.4	2.18	.05
12. I believe that many special persons throughout the world have the ability to predict the future.	3.6	2.9	1.51	ns
*13. The idea of being able to tell the future through the means of palm reading represents the beliefs of foolish and unreliable persons.	2.7	3.5	−1.54	ns
14. I am firmly convinced that reincarnation has been occurring throughout history and that it will continue to occur.	3.3	2.5	1.65	ns
15. I firmly believe that, at least on some occasions, I can read another person's mind via ESP (extrasensory perception).	3.5	2.5	2.47	.03
16. ESP is an unusual gift that many persons have and should not be confused with the elaborate tricks used by entertainers.	3.8	2.5	2.78	.02

continued on p. 60

	Mean Pre-test Score	Mean Post-test Score	*t* Statistic	*p*<
*17. Ghosts and witches do not exist outside the realm of imagination.	3.3	3.8	−1.17	ns
18. Supernatural phenomena should become part of scientific study, equal in importance to physical phenomena.	3.5	2.7	−1.42	ns
*19. All of the reports of "scientific proof" of psychic phenomena are strictly sensationalism with no factual basis.	2.2	2.7	−1.28	ns
20. Through the use of mysterious formulas and incantations it is possible to cast spells on individuals.	2.3	1.4	2.48	.03
21. With proper training anyone could learn to read other people's minds.	2.6	2.4	<1.0	ns
22. It is advisable to consult your horoscope daily.	1.8	1.4	1.37	ns
23. Plants can sense the feelings of humans through a form of ESP.	3.3	2.3	1.78	.09
24. ESP has been scientifically proven to exist.	3.2	2.0	2.80	.02
25. There is a great deal we have yet to understand about the mind of man, so it is likely that many phenomena (such as ESP) will one day be proven to exist.	3.4	3.3	<1.0	ns

n = 11
* = responses to these items are reversed in scoring

Response format
1 = strongly disagree
2 = disagree
3 = undecided or don't know
4 = agree
5 = strongly agree

reported belief, one item concerned psychic phenomena generally; two, ESP in general; one, telepathy; one, psychokinesis (levitation); one, ghosts and spirits; and one, casting spells. As expected, since much course content emphasized ESP, most significant decreases in belief (four items) concerned this topic.

It is interesting to note that although the pre-test Full Score indicates that, generally, the class began the course as "believers" ($X = 77.9$; 75 would be "midpoint" of the full 25-item scale), but they finished reporting themselves as "nonbelievers" ($X = 59.9$).

These results strongly suggest that a course emphasizing a critical scientific approach toward the paranormal can result in significant reduc-

tions in paranormal belief. Indeed, since 9 items (Items 3, 5, 6, 8, 9, 17, 20, 21, 22) were already relatively "low" in reported belief (below 3.0, the midpoint of the rating scale), a restriction in range on these items might have resulted in an underestimate of the actual changes in paranormal beliefs in this sample.

Of course, these results, though supportive, must be considered only tentative and suggestive until further research remedies weaknesses and makes extensions of findings in this study. Some needed changes include: (1) use of a control group to obtain a baseline to evaluate belief change against, (2) followups to evaluate the stability of obtained changes, (3) evaluation of whether change occurs in other, more central personality and cognitive processes that are thought to be related to paranormal belief (e.g., logical thinking ability, dogmatism), and (4) evaluation of whether change occurs in behaviors relative to the paranormal—e.g., preference for books, movies, group activities, etc.

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Humanistic Astrology: A Critique

This 'more spiritual' form of astrology may be praiseworthy in its aims, but analysis shows it to be scientifically and philosophically empty.

I. W. Kelly and R. W. Krutzen

Astrology studies the relationship of a person to the surrounding cosmic environment at a particular time. The important aspects of the surrounding cosmic environment vary in time according to what are considered relevant and usable factors in helping people live a richer and fuller life. In the past, only the relationships between the then seven known planets and background constellations were considered; today astrologers include nine planets and the moon against the background of the earth's orbit. In the future, according to Dane Rudhyar, other scientific discoveries may be considered relevant and usable (Rudhyar 1971a, p. 8):

> In other words, ten variables are considered sufficient to interpret and to attribute meaning to all past and present events or personal crises and to enable the Astrologer to predict future developments. Moreover, the relatively simple formula which a birth-chart constitutes is said by the Astrologer to define the very character of the "native"—even though human character is quite a complex affair! Obviously, it can only do so if the ten variables represent ten basic qualities of existence which may manifest at any and all levels of the human personality. We, therefore, are leaving altogether the scientific realm of quantitative measurements and in Astrology we are operating in terms of the organic interplay between universal qualities or life rhythms.

Some parts of this article originally appeared in I. W. Kelly, "Astrology, Cosmobiology, and Humanistic Astrology," in P. Grim, ed., *The Occult, Science and Philosophy* (New York: State University of New York Press, 1982). We are indebted to Geoffrey Dean for his correspondence with I. W. Kelly on the topic of humanistic astrology, for supplying us with articles on the subject, and for his suggestions.

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Astrology attempts, Rudhyar continues:

> . . . to show that underneath the complexity of traits of human character and of types of natural events and processes of existence, *one can distinguish a few basic qualities and patterns of relationships*; and it has claimed that these few basic factors could be related to the simple motions and interrelationships of the main components of the solar system; i.e., of our closest cosmic environment.

The main distinction between conventional astrology and humanistic astrology is in their orientations: conventional astrology is concerned with essentially practical matters, such as personality, relationships, vocation, and prediction; humanistic astrology is concerned exclusively with helping people understand themselves and their potentials and is generally more spiritual. The materialism of conventional astrology tends to be overemphasized by humanistic astrologers, and many conventional astrologers (especially those outside the United States) would deny that their astrology has ever been other than person-centered.

Another distinction is seldom recognized. The conventional astrological consultation is typically a one-time session in which the astrologer does most of the talking. The humanistic astrologer attempts to do less talking over more sessions, thus drawing out the client as in orthodox counseling and psychotherapy. The distinction is not a unique one because a counseling approach is used by many astrologers who do not subscribe to humanistic doctrine.

Origins

Humanistic astrology originated in the United States in the 1920s, largely as a reaction against the not-unexpected failure of the popular astrology of the day to satisfy spiritual needs. Until recently humanistic astrology has remained a largely American phenomenon.

The basic approach was formulated by Marc Edmund Jones, a Presbyterian minister and Theosophist-occultist who combined astrological ideas with then-current psychological theories in an attempt to relate occult and philosophical concepts to horoscope factors. Jones's approach was extended in the 1930s by the Theosophist-composer-poet-painter-astrologer Dane Rudhyar. Rudhyar incorporated the ideas of Jungian psychology and Eastern mysticism, and eventually coined the term "humanistic astrology." Later he was to develop "transpersonal astrology."

Rudhyar has been the main driving force behind humanistic astrology through his many lectures, over a thousand articles in astrology periodicals, and twenty-five books, the first of which was his best-known work, *The Astrology of Personality,* published in 1936.

Humanistic astrology did not really catch on until the U.S. astrology boom in the late 1960s. Since then it has developed minor variations; but, because the basic approach of Dane Rudhyar is common to them all, we restrict our analysis to his teachings.

The Astrology of Dane Rudhyar

Rudhyar's astrology is (in his own words) "non-scientific, subjective and purely symbolic" (Rudhyar 1979b). The means (i.e., chart style, astrological factors, and basic symbolism) are similar to those used by conventional astrologers; a humanistic birth chart is indistinguishable from a conventional birth chart. The difference lies in the ends: in conventional astrology the aim is usually fairly specific; in humanistic astrology the aim is not to indicate anything specific but to provide meaning (Rudhyar 1971). The humanistic approach is thus at once appealing, uplifting, and nontestable, and no doubt therein lies its attraction. In other words, in contrast to those astrologers who see astrology as an art or science, the humanistic astrologer sees it as a philosophy of life.

Rudhyar's style of writing is abstract, frequently obscure, and long-winded. Furthermore, Rudhyar himself states that the very nature of his astrology denies any objective evaluation (Rudhyar 1979b); thus for every page of the books examined one could ask: Why should anyone believe this? What evidence is there for this claim? Nowhere are answers provided.

Whatever our views about such disdain for facts, we would have no grounds for objection if Rudhyar presented humanistic astrology purely as a hypothesis—i.e., as ideas or beliefs—together with a discussion of why he believes it to be true, an indication of its merits and demerits, an outline of alternative hypotheses and why his should be preferred, and suggestions for experiments whereby his hypothesis could be proved or disproved. But Rudhyar does none of these things. Instead, everything is presented as gospel. He gives no hint of uncertainty, no survey of opposing views, no reference to findings from relevant scientific research, and indeed no evidence of clear thinking (see Wright 1982).

The result is at best a travesty of scholarship; at worst it is irresponsible, especially as Rudhyar is promoting a technique that, if applied to seriously disturbed persons, could conceivably be harmful. It has all the features shown by Gardner (1957, 1981) to be characteristic of the many strange pseudosciences (e.g., dianetics) that have periodically beset the world; this alone is strong grounds for suspicion. So it is not surprising that, despite Rudhyar's vast literary output spanning 45 years and the general thirst of psychologists for new approaches, his ideas have failed to achieve serious consideration in the psychological literature. Indeed this is the first critical survey to have appeared anywhere.

Although Rudhyar's approach is based upon unavailable evidence, we have been able to isolate a number of claims or attitudes that are sus-

ceptible to analysis. These are that humanistic astrology (1) deals with individual uniqueness whereas science does not, (2) is not concerned with precise character analysis or prediction, (3) is not empirical, (4) is holistic, and (5) embraces philosophical relativism. To these may be added (6) Rudhyar's response to criticisms of the kind we will make.

1. *Humanistic astrology, unlike science, deals with uniqueness of individuals.* Rudhyar (1970, p. 460) tells us that "modern science is obliged to ignore the individualness of every living entity," whereas humanistic astrology "deals essentially with the individual."

The first part is incorrect. It is true that science does aim at the general in the form of laws, but it does not follow that it is indifferent to individuals. The search for general laws is conducted in order to understand the individual members of a class of entities or events. Indeed, an ultimate test for a scientific theory is whether or not it explains individual events. For example, a test of a theory of learning in psychology is whether or not Johnny will learn better under the conditions specified by the theory. If it doesn't work then we reject or revise it.

Furthermore, every person is unique in that he has his own personality and physical characteristics, but he is not unique in that he shares many characteristics (chemical, psychological, and biological) with other human beings. Only because of these commonalities can we understand specific interactions between people. Theories in psychology and the social sciences are no doubt less complete than those in the physical sciences, but there has been enough progress in the past 50 years to enable us to deal with individuals. Rudhyar is simply wrong.

Rudhyar would have a point if humanistic astrology performed better than alternative theories. But he presents no comparative tests to demonstrate that this is so, and as far as we know neither does anyone else. All we have are unsupported statements and innuendo, and clearly this is not enough.

2. *Humanistic astrology is not concerned with precise predictions and precise character analysis.* Conventional astrology claims to be able to describe an individual's personality and the main features and events of his life. Rudhyar eschews such an approach. He rejects conventional astrology as outmoded and confused. He tells us that he sees:

> . . . no value in the prediction of exact events or even of precise character analysis. Since I started writing on astrology in 1933, I have received many letters from people telling me how fearful or psychologically confused they had become after consulting with a well-known astrologer and being given biased character analyses and/or predictions of illness, catastrophe, or even death. Statistical research may help to show how unscientific such predictions usually are, but to me what is most necessary is to give to the question I have consistently asked, "What is astrology FOR?"—a more basic, philosophical and spiritual answer. (Rudhyar 1979a, p. 85)

According to Rudhyar (1971b), astrology should be used instead to help an individual to better understand his innate potentialities:

> . . . its essential purpose is to inspire a greater understanding of the many factors and processes in an individual life, and to provide guidance in times of crisis and decision making. Such an approach to astrology is "holistic" in that it deals with the whole person, and with the birth chart as a whole, rather than with isolated planets or aspects labelled "good" or "bad." It refers to any single happening, phase of growth, or period of crisis, to the entire life-cycle from birth to death. At times, it may even be able to suggest what conditions in the past were responsible for present difficulties, just as a pharmacist may infer from a doctor's prescription the nature of the illness which the medicine is intended to cure.

Rudhyar (1975a, 1977) claims that the planetary positions at the time of an individual's birth reveal the set of potentialities imprinted in the genetic code at birth but do not reveal what precise events or relationships will actualize these potentialities.

He tells us (1977, p. 34):

> Everything in your chart is what it has to be, if you are to fully actualize what you were born for, what God meant you to be when you joined the company of the living . . . Allow it to serve its purpose.

This raises the question, How does Rudhyar know that the potentialities shown in the horoscope are in fact correct? The answer he gives (1979b) is that the issue is not whether the indication is correct but whether the individual sees it as valid. But if the correctness is irrelevant, why should anyone master Rudhyar's system and go on to so much trouble to erect a horoscope for people? Why not just give everyone the same horoscope or variations on a theme? Clearly, if correctness is irrelevant, the system becomes theoretically barren and, in practice, bankrupt. The validity supposedly seen by the individual is discussed under the next heading.

3. *Humanistic astrology's truths are not empirical.* Rudhyar (1979a, p. 84) tells us that he is "only interested in astrology as a means to help human beings give a fuller, richer meaning to their lives and to their relation to the universe in which they live." He denies that astrology gives empirical truths (Rudhyar 1970, p. 459), i.e., truths based on observation or experience; rather it is sufficient if "after having studied . . . his . . . birthchart, (an individual) . . . is able to feel a direction and purpose in his life" (Rudhyar 1970, p. 7).[2]

Rudhyar is saying that what matters is not whether our beliefs are based on fact but whether they make us feel better. This reduces astrology to the role of a celestial placebo, to be consumed as directed regardless of the underlying reality. As with any placebo, there can be no objection to

its use provided it is honestly named. But Rudhyar provides no such label: there is no indication that his gospel is only a hypothesis or that (as shown by a large body of psychological research) the supposed benefits can be entirely explained without the need for astrology. In the food industry this kind of deception was outlawed years ago. Why should we be more accommodating when our potentialities are at stake?

Rudhyar's way of putting this is obscure, perhaps deliberately so. For example, in the previous quote he does not define what is meant by a "fuller, richer meaning" to life. Would more money, becoming taller, changing one's appearance, or becoming more self-satisfied contribute to a fuller or richer life? If so, how would astrology help to accomplish these things? Consider also the following from Rudhyar (1975b, p. 24):

> The essential factor in the transformation of man's consciousness is the transmutation of the "solar" I into the "galactic" We. In this We-consciousness the principle of interpenetration operates. This is the galactic dimension of existence. In it, the sense of the separateness of isolated (i-so-lated!) entities (which are strictly and exclusively what they are) vanishes. Everything not only is related to everything else, but, I repeat, every entity—every mind, too—interpenetrates every other entity. As the consciousness of an individual person is able to operate in this spiritual dimension, it begins actively and transformatively to participate in the process of integration of humanity at the level at which the formation of a "pleroma" (or fullness) of Man is possible—the level of the spiritual mind or supermind. At that level unanimity in consciousness prevails, yet each participant in the pleroma—or as a true occultist would say in the "White Lodge"—retains the ability to operate.

Here Rudhyar seems to be saying something like "When you join the club, everybody benefits." The critical reviewer is obliged to ask: Are these statements really true? If so, how does Rudhyar know all these things? Could anything falsify these claims? If not, what is being claimed? If they are based on his own experience, one cannot deny that they may have been of significant value for him, but how does he know that they are not merely subjective experiences that do not reveal any reality beyond the experience itself?[3] (See Carloye 1980 on this point.)

The statements themselves are less than clear. We can visualize an entity interpenetrating another entity, but not countless entities interpenetrating one another. It is easier if interpenetrate means "have an effect on," but if that is what Rudhyar means why doesn't he say so? "Everything is related to everything else," says Rudhyar. Does he mean that everything is causally related to everything else (in which case he is contradicting his own anti-mechanistic thesis), or just related in the sense that everything in the universe has a common origin? The statement is at least trivially true, because one can always find a relationship between two or more things—even if it is just the relationship of simply being different.

The symbolism chosen by Rudhyar to convey meaning is so obscure that one wonders how it could give richer meaning to anyone's life. Such a masterly incapacity for clear expression can only frustrate understanding, but perhaps that is the whole point: too much understanding might, as with the Emperor's New Clothes, prove disastrous.

4. *Humanistic astrology adopts a holistic view of man and the universe.* Rudhyar uses holism both in its normal sense (i.e., to indicate humanistic astrology's concern with the whole person) and as a last-ditch stand against criticism.

In the latter case his use of holism involves not only attributing more to the whole than exists in the sum of its parts, but also the assumption that to examine an isolated part *in reductio* is meaningless. Just as a note alone has essential meaning only insofar as it is part of a melody, Rudhyar contends that life can only be understood when it is considered in relation to its much larger wholes—the earth, the solar system, and the universe (Rudhyar 1977, p. 32). To the questions "How can I know where I belong in this universe? or How can I find the musical score showing what my part is, where my life melody fits?" he responds (Rudhyar 1977, pp. 32–33):

> The sky is the answer. Your birth chart [horoscope] and the way it unfolds its human birth potential is your score. It is the message of the universe to you—a message in the celestial language of symbols. But it has to be deciphered, decoded. Astrology provides you with the technical means.

Rudhyar (1977, p. 33) admits that astrology may not be the only way of finding one's place in the universe but that it is "the most universal, the clearest and most encompassing way—if it is properly used." If an attempt is made to show otherwise, "it is not being used properly." Compare this with faith healing: If you have faith you will be healed; if you are not healed this shows you have insufficient faith! An astrology like Rudhyar's, which is based on holism, can be neither proved nor disproved by scientific methods. By involving holism, astrology is elevated above criticism.

Rudhyar's argument can be easily refuted when it is reversed: If the individual parts don't work then the whole is not likely to work either. Furthermore, the argument is demonstrably invalid: If it were true, then reductionist approaches like behavior therapy or even car repairs would not work. Here our example is doubly relevant because, as Eysenck (1978) has shown, behavior therapy not only works well but works in such areas as bed-wetting and fear of spiders, where holistic therapies like psychoanalysis have failed absolutely. So the mere attribution of holism is no guarantee of benefit. We do not find this inconvenient fact mentioned anywhere in the writings of Rudhyar or his followers.

Rudhyar's use of holism involves other distortions. Thus he (1979a, p. 84) contrasts his own approach to that of the materialists: "If one

accepts the philosophy of Cartesian mechanism or 19th century 'scientific' materialism and the concept of every human being as a separate, essentially self-determined atomistic kind of individual, then man is understood in a certain way" (we are not told exactly what way but presumably it is mechanistic). His own view is a "holistic approach which is the foundation of the most recent physical theories in which the universe is shown to be a web of relationships, and all separate objects—including even atomic particles—are taken to be nothing but particular relationships" (Rudhyar 1979a, p. 83). There is a great difference between Rudhyar's astrology and modern physics, however. The recent physical theories have been arrived at through the testing of previous theories that have been rejected because they could not account for certain recalcitrant phenomena. Quantum mechanics, for example, is a physical theory developed to account for such phenomena, and it was subjected to much testing before it was accepted. By contrast, Rudhyar's theories do not seem to have been arrived at by the testing of anything.

Similarly Rudhyar (1979a, p. 84; see also 1971, p. 8) tells us that "the symbolism of astrology can be very useful—somewhat as the symbolism of group algebra has proven useful in interpreting the tracks produced by nuclear particles when atomic nuclei are violently broken down." The analogy is invalid. We can test the usefulness of group algebra and can demonstrate its predictive value, but nowhere does Rudhyar cite tests that demonstrate the value of astrology.

5. *Humanistic astrology adopts philosophical relativism.* Rudhyar adopts a relativistic response to criticisms; he contends that every position begs the question against its competitors. His relativism is a cultural or epochal relativism. He states (1979b): ". . . to me the question is not whether any method and its findings are 'true' or based on 'belief' but whether they are *valid* in the present state of our western civilization." And (1980): ". . . facts can only be defined as something which the consensus of at least relatively intelligent and mentally developed human beings belonging to a particular culture in a particular period consider objectively and measurably 'real.'" And (1980): "It is the mind which, on the basis of the paradigms of a particular culture, sets the rules for the interpretation."

Relativists like Rudhyar are frequently puzzled by the inability of others to see the apparent obvious truth of their positions. They are puzzled because, if their belief that relativism is true is sufficient for the truth of relativism, then they cannot be mistaken about the truth of relativism. In which case relativism is a proven, true belief. And, since every proven, true belief is an item of knowledge, it follows that relativism is true and the relativist knows it.

The relativist *thinks* he knows relativism is true but he does not; his "knowledge" is illusory.

(1) The pivotal premise in his argument is:

(P) Belief in relativism is proof of its own truth.

The general conclusion he is trying to establish is:

(C) Belief in *p* is proof of the truth of *p*.

His argument is a textbook example of circular reasoning; it begs the question, for the truth of the premise presupposes the truth of the very conclusion it is intended to prove.

(2) The relativist has forgotten that the quest for knowledge begins with the recognition of the fact that some of our beliefs are false. The fundamental difference between knowledge and belief is that it is possible to believe something that is false but that it is impossible to have knowledge and be mistaken.

In arguing that he cannot be mistaken in his relativism when he believes it is true, the relativist not only begs the question but obliterates the distinction between knowledge and belief by making it impossible for *any* belief to be false. This is absurd, for if no belief can be false then no one can be mistaken about anything they believe. In particular, it means we cannot be mistaken in what we believe. But we believe relativism is false. Therefore relativism is false.

However, to say:

(a) What is valid or true is just a matter of cultural belief.

It is just a misleading way to say:

(a') Not everyone believes the same things to be true.

And this is not a contentious claim; it is a rather trivial fact confirmed by everyday experience. It is just a confusing way of drawing attention to the fact that people (and societies) differ in what they believe to be true. As anthropologists and sociologists are forever reminding us, people's beliefs about themselves, others, and the universe in which they live are relative to a great many things. *Beliefs are relative* to one's time and place, to the culture in which one lives, to the available evidence and to each individual's experience. The problem is to determine which of these varying and conflicting beliefs are true. It is with the recognition of the relativity of our beliefs that the search for knowledge begins. Relativism, then, is the problem, not the solution.

The view that truth *is* relative is not a contention about the nature of truth at all. Rather, it focuses attention on the tenuousness of our *knowledge* claims by emphasizing the contingency of the *evidential* basis on which they rest. It reminds us of the constant need to reassess our claims to know in the light of the latest and best available evidence. If our evidence changes we may have to change our convictions. In short:

Truth is absolute but our knowledge of the truth is relative to the evidence we have.

Although the relativity of conflicting beliefs proves we do not know everything, the fact that our knowledge in general is incomplete does *not* in itself prove a person does not know what he claims to know in a given instance.

6. *Rudhyar's response to criticisms.* We have seen that Rudhyar considers the correctness of astrological indications to be largely irrelevant; what matters is whether the indications are seen to be valid by the person concerned.

This argument has been criticized by Dean and Mather (1977, p. 2). They point out that such validity is purely subjective. Rudhyar and his followers "do not mention that subjective assessments are demonstrably unreliable, that the same argument could be used to validate anything from tea leaves to a million dollar check, and that benefit does not necessarily imply validity."

Examples of the last point would be a placebo and a chat over the garden fence that was beneficial even though (unknown to the participants) only polite lies were exchanged.

If a person believes he can fly, according to Rudhyar, the results of the belief are valid for that individual (even though the belief is mistaken) and he should benefit from it. Thus the mistake doesn't matter. This obviously becomes indefensible should his belief lead him to jump off a cliff.

Rudhyar's response (1979a, 1979b, 1980) to this criticism evaded the issue by saying his approach can be understood only in terms of his entire life's work, by debating the meaning of the words "fact" and "reality," by invoking the error of Newtonian mechanics in the light of more recent physical theories, by denying that the scientific method can ever present us with truth, by simply begging to differ, or by successively deflecting the issue back to validity (which is where we came in): "If a Christian mystic says . . . [he knows that] his destiny is to be reunited with the Father, it would be utterly foolish for me to try to tell him that this knowing is not valid—that it is only a belief and not a fact" (Rudhyar, 1980). However, faith, of whatever intensity or conviction, is insufficient to establish the truth of what is believed. If it were, all beliefs would be equally legitimate and equally defensible.

In effect Rudhyar has defined his position as being beyond science; hence any scientific arguments are automatically irrelevant. "To reduce astrology to a practice susceptible to [objective analysis] . . . is to me to repudiate its very special character as a discipline of understanding—a path to broad psycho-spiritual wisdom" (Rudhyar 1980).

It will not do to claim, as Rudhyar has, that humanistic astrology is a way of life rather than a set of beliefs, as if this absolves humanistic astrol-

ogy of its responsibility to establish the truth of its claims. The argument, such as it is, fails, for a person's way of life is a reflection of his beliefs. Consequently, justifying a way of life requires the establishment of the truth of the beliefs underlying it.

The real foundation of Rudhyar's thesis, and of his defense against criticism, is nontestability. The issue is thus not whether Rudhyar's ideas make sense but whether anything that has no provision for the elimination of error is worth having.

If it could be shown that the clients of humanistic astrologers really do become more contented or have fuller, richer lives than clients offered alternative approaches, such as orthodox counseling, religion, one of the secular humanisms, or (as a control) nothing, then there would be some reason for taking his claims seriously. But once again Rudhyar presents no studies showing this to be so. If it is argued that (for whatever reason) such a demonstration is impossible, then humanistic astrology can be dismissed. If such a demonstration is possible, then the onus is on Rudhyar and his followers to provide it. Until this demonstration is forthcoming, there is clearly no reason to believe in either the principles or the practice of humanistic astrology.

Conclusion

The humanistic astrology of Dane Rudhyar is praiseworthy in its aims and shows an undoubted breadth of vision and concern for humanity. But it is dressed in obscurity and obfuscation. Worse, it rests on a radical subjectivism (relativism) that entails that no belief about anything could be false, thereby obliterating the distinction between knowledge and belief. It is therefore no surprise that his theory has no provision for detection and elimination of error. Buyers should accordingly beware.

Notes

1. The notion of synchronicity plays a strong role in humanistic astrology. This position discards the notion that the constellations and planets have a causal relationship to events on earth. Instead, advocates argue that astrology is predicated on planetary and stellar *correlations* with terrestrial events. They contend that the pattern of any instant of time on earth is reflected in the angular relationships of heavenly bodies. Astrological theory therefore postulates *a-causal* relationships between the cosmos and terrestrial events. This absolves the astrologers of engaging in the difficult task of looking for a causal mechanism for their alleged relationships.

However, synchronicity does not seem to be without its serious problems. First, the concept is scientifically sterile. It is a dead end, since it does not encourage the search for new antecedent-consequent relationships. It can only be used to "explain" events after the fact. Second, the theory of synchronicity appears to be conceptually muddled. The synchronistic idea that the meaningfulness of some coincidence or relationship is found in nature is wrong. Meaningfulness must be linked to a point of view or perspective, and a point of view cannot be divorced from an interpreter who "owns" that point of view (Zusne

and Jones 1982).

2. Rudhyar (1977b, p. 34) reacts with horror to the view that astrology should be investigated by scientific means:

> If it could actually be proven by statistics and all the modern scientific techniques that it is a science, reliable in its predictions, great possible harm could be done to humanity. For it would at once be used by governments and big business to control the lives of people and to establish an astrologically determined caste system through a rigid analysis of what supposedly every person is capable of doing, in general and at any particular time.

3. The humanistic astrologer Michael Shallis (1981) argues that astrology rises from a totally different world-view from that of science and is not a system of knowledge in the way science is. He believes that astrological knowledge is acquired through *intuition.*

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Book Reviews

Psychology of the Out-of-Body Experience

Beyond the Body. By Susan J. Blackmore. William Heinemann Ltd. on behalf of the Society for Psychical Research, London, 1982. xv + 271 pp. £8.50.

Reviewed by James E. Alcock

In every age and in every society, human beings have speculated about the nature of life, the mysterious interplay between the mental and the physical, and the fate of the human personality when the body ceases to live. The ancient belief in mind-body dualism, basic to virtually all religious doctrines, provides one answer to the enigma of our existence: our physical bodies are but a temporary abode, and the physical world is but one aspect of a universe constructed on a much grander scheme than mere atoms and molecules would allow. To those for whom such beliefs rest comfortably, immortality of one form or another seems assured.

However, the rise of science led some nineteenth-century scholars to feel ill at ease with religious teachings of immortality, which seemed less and less tenable in the face of scientific discovery. Yet the need, the wish, to believe in an afterlife continued, and in 1882 a group of British scholars founded the Society for Psychical Research, which was to be dedicated to the pursuit of evidence that would provide a *scientific* footing for belief in the postmortem existence of the soul. Any evidence suggesting that the mind, the "personality," the "soul" of an individual can function separately from the body was eagerly examined. Accounts of mediumistic feats, tales of apparitions, and claims of being able to "leave" one's body were collected and scrutinized, but the major finding that emerged was that anecdotal evidence is very difficult to study and exceedingly unreliable.

Beyond the Body is part of a series being published by this same society to mark the centenary of its existence, and the theme of this book touches directly upon those concerns that were so basic to the society's formation: Is there an aspect of human life that can exist separately from the physical body? Such a question is as relevant today in parapsychological circles as it was a century ago, for in recent

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years parapsychologists have shown renewed interest in phenomena associated with supposed mind-body separation. This interest has shown itself not only in laboratory studies of the "out of body" experience (OBE), but also in the collection and analysis of accounts of the closely related near-death experience (NDE).

Dr. Susan Blackmore brings to the study of OBEs strong credentials from the domains of both psychology and parapsychology. She is a researcher in the Brain and Perception Laboratory of the University of Bristol. Her particular interest in OBEs is the result of a personal OBE experience, and her reaction to this experience, as described in the opening pages of the book, gives the reader a good indication of the approach she follows throughout: Rather than simply falling back in fascination and amazement at the wonder of her experience and taking for granted that it was objectively real, she suspended judgment about the explanation and set about to learn as much as she could about such experiences in order to generate some hypotheses about their source. This book is about that investigation, and a fascinating study it is.

What is an OBE? Blackmore argues that the most reasonable definition is simply that an OBE occurs when one seems to perceive the world from a perspective outside the physical body. Thus, if someone reports such an experience, the person is to be believed, since the experience itself is private. However, this does not mean that one accepts automatically that its contents were objectively veridical.

Blackmore found that OBEs seem to be rather infrequent occurrences and that most people who have such experiences have only one, or at most a few, in a lifetime. Analysis of collections of accounts about OBEs (some of which she personally collected) suggest that the OBE is experienced typically in only the modalities of vision and hearing. The sensations of flying or floating are common, and objects often appear to be unusually vivid, sometimes glowing with a light of their own. Often one's own body is observed, as though from outside, and sometimes the individual seems to be located in a second body. Occasionally, a silver cord is seen connecting the two bodies. Rarely, claims are made that a person possesses psychic abilities during an OBE. The experience seems to be a very positive one for most people.

In her quest to understand the OBE, Blackmore examines it from many different perspectives. She first turns to the doctrine of astral projection, in which the notion of being able to leave one's body and travel in another level of reality is a central tenet. Two conclusions emerge from this analysis. First, the doctrine of astral projection has little to offer to the scientific investigation of OBEs: the theory is so convoluted and elastic that it can be massaged to fit almost any data, and therefore it is essentially untestable. Also, many reported OBEs do not fit into the astral framework. Second—and the import of this should not be overlooked—the doctrine of astral projection furnishes a framework that allows people to make sense of what otherwise would be very strange experiences, and it is this that has contributed to the doctrine's success.

From the study of astral projection, Blackmore turns her critical eye to case studies and surveys dealing with OBEs, to the ways in which OBEs are viewed in other cultures, and to methods developed, usually by practitioners of the occult arts, to induce OBEs. The common goal of the various techniques seems to be to produce a state of physical tranquillity and mental alertness. Exercises to improve one's powers of relaxation, imagery, and concentration are employed.

Could OBEs be a kind of dream? Blackmore finds good reason to conclude

that OBEs are not dreams in the normal sense, but she finds that they do have much in common with "lucid" dreams, dreams in which the dreamer is aware of being in an altered state of consciousness and may even be able to control it. Many practiced astral travelers have reported having had lucid dreams, in that they occur during "Stage 1 REM" sleep. However, OBEs begin not from sleep but from wakefulness. Judging from the little laboratory work that has been done, it seems that the OBE is not a discrete mental state, with its own characteristic EEG patterns. It also seems that the OBE does not reflect a dream state either: subjects are drowsy or even in a light sleep during their OBEs, but they are not in the state characteristic of dreaming. Thus the OBE is not just a lucid dream.

If OBEs are not dreams, could it be that they are the products of some kind of mental dissociation, such as occurs in some psychiatric disorders? Proponents of a psychoanalytic interpretation of the OBE have suggested that the OBE is an attempt by the ego to defend itself against some threat to the integrity of the individual, thus leading to "depersonalization," a state in which an individual feels a strong sense of unreality about his or her body and environment, to the point of sometimes feeling separated from the body. Because of marked dissimilarity, particularly with regard to the mood, between accounts of depersonalization and OBE/NDE experiences, Blackmore rejects this explanation as a serious possibility. She points out that psychoanalytic theorizing has its own serious problems of untestability, and to explain OBEs in terms of a basically untestable theory would mark no advance in our understanding.

Blackmore's analysis of occult and paranormal interpretations of the OBE ultimately leads to their rejection as well. Modern parapsychological studies of psychic vision associated with OBEs have shown that OBE vision, if it exists, is as erratic and confused as ESP has always appeared to be. Says Blackmore: "One of the major findings of parapsychology, if it can be called a finding, has been that ESP is extremely erratic and inaccurate if it occurs at all, and it is more or less impossible to distinguish a genuine ESP 'hit' from a chance hit" (p. 191). Some might argue, she says, that the OBE involves imagination plus ESP, but this is only putting together two catch-all terms, "imagination" and "ESP," thus explaining nothing at all; and for this reason she rejects this notion.

She believes that a purely psychological theory will provide the most solid basis of explanation, and she is drawn by the evidence to the conclusion that OBEs (and near-death experiences) are based on the processes of imagination and hallucination.

She concludes the book by presenting her own theory. It will strike sympathetic vibrations in the minds of most experimental psychologists. Drawing on her knowledge of the psychology of perception and experience, she argues that the OBE is best seen as an altered state of consciousness (ASC), with everything that is perceived in it being the product of one's own memory and imagination, imagination much more vivid than that associated with everyday life. She suggests that there are four conditions necessary for the evocation of an OBE: (1) vivid and detailed imagery; (2) low reality testing so that memories and images seem real, (3) reduced sensory input or lack of attention to sensory input, and (4) the maintenance of awareness and logical thinking.

She explains that in order to maintain a stable sense of body image and location, our cognitive processes rely on sensory input from various parts of the body. If this is reduced or absent (consider for example the circumstances of the near-

death experience), the sense of body image may not be coincident with the physical body. Indeed, our memory systems, in order to reduce complexity, store much of our memory about ourselves in a form that seems to involve us as observer, at a vantage point above our bodies. (For example, if you imagine yourself at breakfast this morning, you will no doubt see yourself in that image, and likely from a perspective outside and above your body.) In the OBE, then, the person seems to be viewing the room he or she is in in one of the ways it is represented in memory, from a point above the body.

Rather than discouraged by her conclusion that the OBE is not parapsychological in nature, Blackmore is excited, she says; for here is an altered state of consciousness that with careful study we may be able to explain. She wisely suggests that if we are eventually to build a comprehensive knowledge of altered states of consciousness and their interrelationships, the trials of the adepts and the long tradition of occult learning might help us:

> Looked on as maps of experiential space, we may find that these old traditions are better guides than we thought for the modern explorer. The psychological approach may even begin to make sense out of the otherwise rather baffling regions and planes of the "astral world." One can see them as reflections of the structure and organization of the brain and its processing systems. [p. 251]

I am tremendously impressed with this book. It is an excellent work, a book that earns my great respect for Dr. Blackmore's abilities as a critical investigator in the best scientific tradition. She at all times approaches her subject with a high degree of intellectual rigor, and brings to her analysis an excellent knowledge of the difficulties associated with doing research with human subjects. This is an important book, by far the best work available on the subject. It is also very interesting and highly readable for its discussions of everything from astral planing, to N-rays, to attempts to photograph the soul. Most important, it is an excellent study of how we human beings can be so fervent in our attempts to delude ourselves, and it clearly shows the value of careful and rigorous scientific procedure and analysis.

The Society for Psychical Research, too, is to be commended for its part in the book's publication. I hope that, coming as it does from within the parapsychological community, this book will influence other parapsychologists to come to grips with their beliefs that OBEs and NDEs are best explained as a manifestation of some as-yet-undemonstrated psychical process. If there were more psychical researchers with the talents of Dr. Blackmore, the gulf that isolates psychical research from mainstream science could rapidly be bridged. •

Take-Home Test for Psi

Test Your ESP Potential. By James Randi. Dover, New York, 1982. 32 pp. + 8 pp. of testing cards. Paper, $3.50.

Reviewed by Gordon Hammerle

It is not surprising to find a booklet offering a way for a reader to "evaluate the extent and significance of his own, his friends', and his family's powers of ESP." What *is* surprising is to see James Randi's name as author of such a publication. Yet, as part of a series of "Dover Novelty Books and Popular Recreations" (which includes *Cut and Fold Paper Spaceships that Fly* and *Cut and Make Monster Masks in Full Color*) comes a test kit that Randi claims will provide results that "will have to be considered as only indicative—perhaps highly indicative!—of possible ESP powers."

The booklet describes the basic mechanics of ESP experimentation and supplies the necessary perforated Zener-type cards and data sheets. Randi describes rules to follow and pitfalls to avoid in performing telepathy, clairvoyance, and precognition experimentation. For example, he warns against "optional stopping," where a subject might quit once a string of "hits" (matches between the guess and the hidden target) occur. He warns of the dangers of ignoring negative results, of an insufficient number of trials, and of experimental conditions that allow the experimenter and the subject to see one another (which might allow conscious or unconscious signaling of the target cards). He also suggests having a disinterested person do the actual data analysis. He warns against cheating, arguing that such dishonesty will be discovered. He claims that, although cheating is possible, the kit makes it "fairly easy . . . to conduct proper and valuable experiments."

To evaluate the reader's results, a statistical table is provided that indicates the number of "hits" needed for significance in experiments involving 25, 100, 250, 500, 1,000, or 2,000 trials. The table was prepared by treating the study as a binomial probability problem, and it counts as "significant" those outcomes that reach the .05 level. What this means can be shown by example. Let's say the subject goes through the 25 cards (of 5 symbols) four times, thus making a total of 100 guesses as to the identity of the cards. For 100 trials, the chance level would be 20 hits (since no feedback is provided to the subject). Let's assume our subject achieved 28 hits. Using the chart in the kit, we find the value needed for significance for 100 trials is 28. This means that, by chance alone, we would expect a subject to get 28 or more hits only one time in twenty (hence, we say the .05 level). This criterion is quite common in research, although more conservative investigators might instead use a .01 level (thus demanding that, to be considered statistically significant, the outcome would occur by chance only one time in one hundred).

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Randi tells the reader that "you may begin to believe paranormal powers are present if you reach or exceed the figures listed, if all other rules have been observed and no cheating is taking place." Yet, in the context of thousands of similar studies that have failed to document extrasensory perception, the most rational and parsimonious explanation would be that these 28 hits just represent one of those 5 times in 100 when such an extreme result would happen purely by chance.

The diligent user of this manual could plot the number of hits in a large number of experiments and, assuming no ESP existed, would find a normal curve whose mean would be at the chance level. A few results would be well above chance and some well below chance (the latter often labeled "psi-missing" by those especially anxious to find *something* of value in the data). Yet *all* would represent a predictable variation around the chance level. Should you begin to believe paranormal powers are operating? No, unless the results were more dramatic or occurred repeatedly *and* if all other means of communications have been eliminated. Randi compounds this error by giving an example of a subject getting 21 hits out of 100, a level he describes as "just on the edge of significance." Yet 21 hits would be a very common result, and would not be considered "on the edge of" or anywhere near significance.

Who will have to pay for the false hope given here? James Randi will, as he asks the reader to report his or her results by sending him all the data sheets for his analysis and opinion. "If the results are interesting enough," he adds, "you may be asked to participate in further tests in a scientific laboratory." Again, assuming ESP does not exist, there will be a finite and predictable number of persons who achieve what Randi suggests may indicate paranormal powers, especially if they count all outcomes that are "on the edge of significance."

Does the kit achieve what it claims? Other than with the data interpretation, Randi gives a creditable overview of ESP experimentation. Yet he could have spent more time on the many ways bias, intentional and unintentional, could occur. No one would be more qualified than Randi, who has tested hundreds of people claiming ESP powers, including a substantial number of outright cheaters. For example, in one test I conducted with my wife, I told her to listen carefully as I wrote each target down on the data sheet. (The experimenter draws both the target and the response on the data sheet for later tabulation.) Since each of the symbols (circle, parallel lines, triangle, square, and star) has a different number of lines, it was easy for her to achieve near-perfect results by attending to the auditory stimuli. Readers might learn more from a description of these pitfalls than from running tests that have been conducted, unsuccessfully, for decades.

Why did Randi prepare this kit? Does he believe that anyone would change his mind about the paranormal after achieving just chance results on the tests? If so, Randi has forgotten his message from *Flim-Flam!*—that the losers in a controlled test "invariably drag in the usual silly cop-outs to explain their failures" (p. 3). Perhaps *Test Your ESP Potential* is aimed more at the individual who is curious, but is truly neutral, about ESP. Yet there seem to be very few people who are truly open-minded about parapsychology. Or maybe Randi has decided to cash in on the vastly larger market for books that appeal to believers in the paranormal. If so, he owes it to those of us who admire him to plow the profits from this kit back into researching and writing the sequel to *Flim-Flam!,* a book he has promised and which would be a much more valuable contribution. •

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Some Recent Books

Listing here does not preclude more detailed review in a future issue.

Asimov, Isaac. *The Roving Mind.* Prometheus Books, Buffalo, N.Y., 1983, 350 pp. $17.95. Aptly titled anthology illustrating the diverse musings of one of our most agile minds. The opening essays reprint Asimov's incisive writings on the creationist/evolution controversy. This section is followed by selections on UFOs and scientific heresy. Then it's on through the world of science and ideas.

Cerullo, John J. *The Secularization of the Soul: Psychical Research in Modern Britain.* Institute for the Study of Human Issues, 3401 Market St., Philadelphia, PA 19104, 1983. 194 pp., $18.50. Study by historian of the formative years of the psychical movement, including his analysis of the early social appeal of the paranormal in Victorian England.

de Camp, L. Sprague. *The Fringe of the Unknown.* Prometheus Books, Buffalo, 1983. 208 pp. $16.95. Enjoyable collection of essays on controversies, mysteries, and oddities in science and technology. In three parts, "Our Ingenious Forebears," "Beasts of Now and Then," and "Scientists, Mad and Otherwise." The Essay "Mad Men of Science" is a fascinating excursion into the realm of scientific idiosyncrasy and worse, filled with little-known historical anecdotes. "Orthodoxy in Science," "Hoaxes in Science," and "Little Green Men from Afar" are also especially illuminating. De Camp combines a learned mind with a knack for sharp description and analysis. And he's never preachy. A delight.

Godfrey, Laurie R., ed. *Scientists Confront Creationism.* W. W. Norton, New York, 1983. 324 pp. $19.50. A clear and detailed evocation of the science that supports evolution, with special emphasis on addressing the distortions and misstatements of creationism. Contributions are by well-informed scientists.

Klass, Philip J. *UFOs: The Public Deceived.* Prometheus Books, Buffalo, N.Y., 1983. 310 pp. $17.95. Klass applies his methodical investigative journalism to major UFO claims and events since the publication of his 1975 book *UFOs Explained.* Topics include the CIA papers on UFOs, claims of UFOs over SAC bases, a followup on the Delphos, Kansas, case, the Army helicopter encounter, the Travis Walton UFO "abduction," the Val Johnson police-car UFO "attack," the New Zealand UFO lights, and the credibility of claims of abduction under hypnosis. Each of these subjects is treated to Klass's piercing skeptical investigation. There are also general chapters on eyewitness unreliability, the new credulousness toward crashed-saucer claims, and media carelessness regarding UFO claims. The style is highly documentary (filled with names, dates, and excerpts from news accounts, correspondence, documents, and phone transcripts). An important, carefully researched book.

Krupp, E. C. *Echoes of the Ancient Skies: The Astronomy of Lost Civilizations.* Harper & Row, New York, 1983. 386 pp. $19.95. For those who want to learn about the *real* marvels and wonders of archaeoastronomy—the study of the astronomical knowledge of ancient cultures and the role the patterns of the heavens played in all aspects of culture—this is an indispensable book. Astronomer Krupp, director of Griffith Observatory, communicates his

fascination with the struggle of cultures to bring meaning and order to their world through attention to the sky. A worthy sequel to his award-winning *In Search of Ancient Astronomies* (1978).

Lauden, Rachel, ed. *The Demarcation Between Science and Pseudo-Science.* Center for the Study of Science in Society, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, 1983. 200 pp. (bound typescript). $4.00. (Order from the center.) Report of a 1982 workshop sponsored by the center. An interesting, if uneven, mix of eight papers by sociologists and historians struggling with the distinctions between science and pseudoscience.

Nickell, Joe. *Inquest on the Shroud of Turin.* Prometheus Books, Buffalo, N.Y. 1983. 178 pp. $14.95. The first book-length skeptical critique of the claims about the shroud. Nickell, with the assistance of seven forensic analysts, art experts, and scientists (one of whom is Los Alamos physicist Marvin Mueller, who wrote the lead article in our Shroud issue of Spring 1982), has provided an indispensable rational examination of the shroud claims. Obligatory reading for anyone who wants to be knowledgeable about the shroud.

Zetterberg, J. Peter, ed. *Evolution versus Creationism: The Public Education Controversy.* Oryx Press, 2214 N. Central, Phoenix, AZ 85004, 516 pp. 1983. $37.50. Thirty-three essays that (1) discuss the theory of evolution and its place in science education, (2) examine the creationist movement, (3) state the position of "scientific creationists," (4) respond to creationists' arguments, (5) explore legal issues, and (6) critique the attempts to treat Genesis as science. Included is the text of Judge Overton's landmark decision in the Arkansas case. A revised version of a resource manual compiled for a conference on "Evolution and Public Education" at the University of Minnesota. An excellent reference.

—Kendrick Frazier

Articles of Note

Bambach, Richard K. "Responses to Creationism." *Science* 220:851–53, May 20, 1983. Review of five books by scientists on the differences between evolutionary science and creationist arguments: Kitcher's *Abusing Science,* Newell's *Creation and Evolution,* Futuyama's *Science on Trial,* Godfrey's *Scientists Confront Creationism,* and Eldredge's *The Monkey Business.* They are a "bonanza of good, vigorous scholarship," that "evaluate the creationist objections to evolution and convincingly reject them." Also reviewed is *Christianity and the Age of the Earth,* by D. A. Young, an ancient-earth but anti-evolution geologist. Young pleads with fellow creationists to give up their misleading writings claiming the earth is young but still manages to deny evolution on religious grounds, "the creationist-evolution dichotomy in its clearest form," comments Bambach. "We should applaud the good efforts

of all the authors of these generally excellent books," concludes Bambach. "Every scientist should read at least one of these timely books."

Boykin, John. "Surgery Without Scalpel—or Cure." *Science 83,* May 1983, pp. 77–78. Short report on magician Robert Steiner's (he's head of the Bay Area Skeptics) campaign to show how "psychic surgeons" hoodwink a gullible public.

Estling, Ralph. "The Trouble With Thinking Backwards." *New Scientist,* June 2, 1983, pp. 619–21. Much-needed article on fallacious conclusions reached from reasoning backward, from presumed effect to ostensible cause. One example is Sir John Eccles's conclusion that the odds of the combination of genes that went to make up Eccles actually happening are 1 in $10^{10,000}$ (therefore the fact that he does exist is evidence of supernatural or Godly maneuverings). Another is Sir Fred Hoyle's similar conclusion that life could not possibly have originated on earth because the odds (as he calculated them) of forming a workable set of enzymes by random shuffling of amino acids are less than 1 in $10^{40,000}$. Estling addresses the logical fallacies in such *a posteriori* reasoning. He also points out that, while chance is *involved* in the organization of complex biological systems, the process is "organized, systematic, and in fact inevitable by the nature of atomic action itself," and therefore not determined by *random* chance.

Gould, Stephen Jay. "Mind and Supermind." *Natural History,* May 1983, pp. 34–38. Interesting critique of the "anthropic principle"—the idea recently fashionable among some physicists that the universe is the way it is in order to make intelligent life possible. Gould considers this another case of "raw hope gussied up as rationalized reality." It is no different in his view from naturalist Alfred Russel Wallace's "ill-founded and quaint" 1903 argument that conscious life could not have arisen if the physical structure of the earth, solar system, and universe were only slightly different. Trouble is, our knowledge of the physical structure of these entities has changed totally since 1903. Yet some physicists are using the same fallacious argument—now based on our present, radically different view of the universe. Gould prefers Wallace's version of the anthropic principle to the more recent one because at least Wallace didn't state his with such "fatuous certainty."

Harper, Alfred E. "Mythical Thinking vs. Scientific Thinking." *ACSH News and Views* (American Council on Science and Health) March/April 1983, pp. 4–5. Biochemistry professor speaks to the sore need for skeptics to deal with the many irrationalities of the day. His emphasis is on the field of nutrition (bizarre diet books, simplistic analyses of major health problems, etc.).

Kelly, I. W., and K. Mazurek. "The Coherence of Claims with Scientific Theory and 'Basic Limiting Principles': The Case of Psychic Phenomena." *Review Journal of Philosophy and Social Science,* 8:82–96 (1983). Examination of the lessons inherent in the fundamental discordance of the claims of psychic phenomena with well-established scientific methods and data. Given the lack of reliably repeatable phenomena, lack of reliable relationships with other phenomena, lack of any theory, and all the other shortcomings, the authors conclude that the credence of psi is "the most fanciful of objectives."

Kurtz, Paul. "Humanism, Science, and Religion." *National Forum* (Phi Kappa Phi journal), Spring 1983, pp. 17–20. Thoughtful essay exploring why magical and wishful thinking will not easily disappear in the modern world. Con-

cludes that secular and religious cultures will continue to exist side by side. "Perhaps the most we can hope for is that we may moderate and liberalize intolerant moralities and seek to develop mutual respect and tolerance as moral principles. . . ."

Moore, Robert A. "The Impossible Voyage of Noah's Ark." *Creation/Evolution,* no. 11, Winter 1983, pp. 1–43. An entire issue devoted to a point-by-point scientific refutation of the story of Noah's ark. The critique is aimed not at the account in Genesis so much as at the leading creationist books and studies that seek to prove the account is secular history. Moore addresses the building of the ark, the needs of the animals, genetic problems, taxonomic problems, parasites and diseases, food and water problems, ventilation, and countless other specifics. The editors note that it may seem bizarre to devote an entire issue to a detailed critique of a story that knowledgeable people know is largely mythical, metaphorical, poetic, theological, and moral. But the creationists' insistence on claiming it was an actual historical event has forced critics to take them "almost as seriously as they take themselves."

"Space Kidnappers." *Discover,* May 1983, p. 8. Skeptical Eye report on reputed UFO abduction tales related under hypnosis to pro-UFO psychologist Leo Sprinkle notes the recent confession of one such prominent abductee, Christy Dennis, that she made the whole thing up.

Tierney, John. "Perpetual Commotion." *Science 83,* May 1983, pp. 31–39. Feature on the continuing search by would-be perpetual-motion-machine inventors for the mechanical equivalent of a free lunch. Reveals that Blacksburg, Va., inventor Howard R. Johnson has no working machine for his "amazing magnet motor," only an unimpressive model and self-expressed hopes.

Tobacyk, J., and G. Milford. "Belief in Paranormal Phenomena: Assessment Instrument Development and Implications for Personality Functioning." *Journal of Personality and Social Psychology* 44, no. 5, 1983. Study links certain paranormal beliefs with less critical inference-making, greater dogmatism, and greater endorsement of irrational beliefs.

Tudge, Colin. "Hating Science Is Wrong." *New Scientist,* April 7, 1983, p. 37. Laments the hatred of science fashionable in some educated circles and the embracing of "quasi-science" in others. Discusses some of the reasons for both.

Whitehouse, David. "A Decade (and More!) of Pseudoscience." *New Scientist,* April 7, 1983, p. 38. Astronomer, annoyed by Von Däniken-type nonsense, calls for scientists to take up the cudgels and "pour tough criticism on the rubbish being written, . . . counter the half-truths and misconceptions that are being seeded unchecked in all areas of society." He criticizes his fellow scientists who have remained silent on pseudoscience.

—*Kendrick Frazier*

From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters should be as brief as possible. They should be typed and preferably double-spaced. Letters are subject to editing for space and clarity. Not all of those submitted can be published. Address letters to: Editor, the SKEPTICAL INQUIRER, *3025 Palo Alto Dr. N.E., Albuquerque, NM 87111.*

Reappraisal of Mars correlation

I would like to thank Abell-Kurtz-Zelen for the reappraisal of their "Mars Effect" experiments (SKEPTICAL INQUIRER, Spring 1983). It is courageous of them to make note of some of their errors. Two points seem open to misinterpretation, however.

Abell-Kurtz-Zelen say that (in 1977) "much of Gauquelin's data was unavailable for scrutiny." Actually, my data were, and still are, available from A to Z. They were published in several volumes in 1970 and I was (and still am) keeping all of them in the files of my laboratory. The directories I used for gathering my samples are still available also, and, of course, anybody can directly check the accuracy of the data by writing to the birth registry offices where 100 percent of the information remains accessible.

Concerning the American Champions study, Abell-Kurtz-Zelen object to my selection of 88 U.S. sportsmen from the entire sample of 408. I would like to recall that this selection was not the first point of my argument (SKEPTICAL INQUIRER, Winter 1979-80, pp. 31-43). My main point was that the athletes from the first subsample gathered by Paul Kurtz display a significantly stronger "Mars effect" than the athletes from the second Kurtz subsample. This result is consistent with my former observations because the first American subsample obviously includes athletes of greater fame than the second American subsample.

I fully agree with Abell-Kurtz-Zelen that "the final verdict (about the Mars Effect) will require time and new attempts at replication." In fact, a French group of skeptics, the CFEPP (French Committee for the Study of Paranormal Phenomena) is starting a new independent experiment. A written agreement was published (*Science & Vie,* October 1982). Unfortunately, the CFEPP refused to have neutral judges supervise the entire study as I myself requested.

Michel Gauquelin, Director
Laboratoire d'Etude des Relations
entre Rythmes Cosmiques
et Psychologiques
Paris, France

Paul Kurtz and George Abell respond:

We appreciate M. Gauquelin's kind comments about our commentary on the "Mars effect" controversy, although we don't know that it is "courageous" to admit one's errors or to revise one's interpretations; this is part of the ongoing process of scientific inquiry.

When we said "much of Gauquelin's data was unavailable for scrutiny" we meant that many names found in the directories of famous sports champions he used were absent from his published lists. Series A, Volume I, of his laboratory's publications lists 33

directories from which athletes were selected for the original sample of 2,088 athletes, but on page v Gauquelin states that some selection from the directories was necessary. However, he does not give the criteria for that selection. In other words, we are unable to verify all of his data or ascertain which of the champions were sent for and which he omitted, and on what basis. (Incidentally, it is not true that he has made all of his data available. For example, despite repeated requests, he has not supplied us with a list of the so-called "lesser" champions that he deleted from his most recent European study.) In our judgment there is a good deal of unexplained leeway in the manner in which the champions have been selected.

We reiterate, for the American sample we sent for data on all *of the names listed in the directories and* Who's Whos *of famous sports champions without selection, and used* all *the birth data received. These directories were not compiled by us, and they could not be used to decide arbitrarily which champions were "more famous" than others. The results were negative. We do not know whether Gauquelin, in his original study, sent for and used all the names of sports champions from the French and European directories or whether they were selected by him on the basis of subjective criteria, or whether the criteria were established before part or all of the data were in hand. That is why we cannot confirm the significance of his statistical analysis supporting the "Mars effect." That is now the crux, and perhaps the Achilles heel, of the "Mars Effect" dispute.*

Fortunately, a group of scientists in France is attempting to carefully examine Gauquelin's hypothesis independently by resampling famous sports champions. We regret that Gauquelin has attacked this effort even before it gets underway.

Abell, Kurtz, and Zelen made their task difficult by failing to emphasize that a statistical correlation is not a causative relationship (see Marcello Truzzi, *Zetetic Scholar,* no. 10, 74-81, December 1982). In their reappraisal of the "Mars effect" (SKEPTICAL INQUIRER, Spring 1983), I noted the following:

1. One of Gauquelin's correlations is dubbed the "Mars effect."

2. "In this instance . . . the procedure used by Gauquelin appears to have been vindicated. To say this, however, in no case verifies that the Mars effect is real."

3. "Gauquelin's planetary effects . . . are not explicable in terms of known laws."

If Gauquelin's procedure stands, then the results are valid (or "real"), including the one termed "Mars effect." Point 2 therefore seems illogical: until one realizes that Kurtz et al. think of the "Mars effect" in a dual manner—first as defined under point 1, that is, as a statistical correlation; but also, second, as an influence of the planet Mars on those born at certain times and places, that is, as a causative relationship. That implicit or subliminal "double entendre" gets Kurtz et al. into trouble.

It might be better simply to acknowledge that Gauquelin's procedures seem to be technically sound, but to emphasize that the *significance* of the correlations remains to be examined. There are correlations, after all, that do not reflect a straightforward causative relationship: old age probably does not cause cancer, for example, nor does pregnancy ensue from the "cause" of being aged between about 15 and 45—yet the corresponding correlations are very "real."

Moreover, those last correlations show much greater coupling between the variables (age and cancer; age and pregnancy) than does the "Mars effect." Had Gauquelin found that 95 percent of sports champions were born with Mars in a key sector, I might share the concern that moves Kurtz et al. to seek clear disproof. But 22 percent compared to an expected 17 percent

does not impress me, despite the fact that the difference is "statistically significant." Rather, the weakness of this coupling leads me to expect that a noncausative explanation is more likely than a causative one: perhaps there are cyclical phenomena that have similar periods but no other connection than that; perhaps subtleties of weather are involved. Quite likely there are things of that sort of which we are not yet aware and which are worth investigating.

By thus seeing the matter as an unexpected correlation and not as indication of cause, I can be interested without fearing that astrology might have something to it after all. But, as shown by Point 3, Kurtz et al. think that Gauquelin has indications of "planetary effects"; which they assume, moreover, to be "not explicable in terms of known laws." It is those assumptions, not Gauquelin's results, that put a heavy burden on Kurtz et al. to find disproof.

Henry H. Bauer
Dean, Arts and Sciences
Virginia Polytechnic Inst.
and State University
Blacksburg, Va.

Eysenck disputes review

In your Spring 1983 issue Paul Kurtz published a review of my book (with D. K. B. Nias) *Astrology: Science or Superstition?* When someone is convinced of the correctness of his views and finds himself opposed by facts he cannot contradict, he is apt to fall into the error of *argumentum ad hominem* and use the technique of guilt by association in order to discredit his opponent. It is regrettable that Professor Kurtz has fallen into this error, and one also regrets that the SKEPTICAL INQUIRER allowed him space for this particular, rather unfortunate excursion. The points Kurtz makes would be irrelevant even if they were true; unfortunately they are not.

Kurtz states that "Eysenck . . . loudly defended the thesis, based upon his (Eysenck's) research, supported by the tobacco industry, that there is no linkage between cigarette smoking and lung cancer." Leaving aside the emotionally colored adverb, I have never for a moment suggested "that there is no linkage between cigarette smoking and lung cancer." Only someone who has never read my book *The Causes and Effects of Smoking* could possibly make such a statement. The aim of the book was to point out that there were statistical and methodological weaknesses in much of the research on which the causal theory is based. I expressly dissociated myself from critics who went even further than that and rejected the causal hypothesis in toto. The research reported in this book was mainly directed to an investigation of genetic factors in taking up and maintaining the smoking habit, and I have heard no serious criticisms of our methods or results.

Similarly, Kurtz states that: "Eysenck was . . . an early outspoken proponent of Jensen's thesis that there are racial differences in I.Q."

There is a difference of about 15 I.Q. points between blacks and whites in America. I know of no psychologist who doubts this fact. What Kurtz is probably referring to is Jensen's hypothesis that at least some of this difference is due to genetic causes. Again, Kurtz shows little acquaintance with my book *Race, Intelligence and Education* when he states that I was an "outspoken proponent" of this thesis; in my book I came to the conclusion that no biological or genetic studies could possibly be adduced to support Jensen's hypothesis and that it rested entirely on circumstantial evidence that could be interpreted in different ways by different people.

I could go on arguing about these *argumenta ad hominem,* but perhaps enough has been said to indicate that an apology for all this misrepresentation would be in order. Kurtz also misrepresents the study by Mayo, White, and Eysenck. (Typically he puts my

name first, when really the order was as indicated above, with Mayo the first author because he carried out the empirical study, with Dr. White and myself being responsible for the analysis.) In discussing the surprisingly positive results, I purposely included a section to indicate that there was an alternative hypothesis, namely, knowledge by a person of his own sun sign and the associated personality features. Some checks against this had been built into the experiment by Mayo, but they did not seem to me sufficient. In my later work (with Nias) I tested the hypothesis in greater detail, to find that it actually accounted for the facts rather better than Mayo's original hypothesis. To sum all this up by saying: "Eysenck now concedes that he was overhasty in his claim" is inaccurate reporting, designed to prejudice the reader against the author.

Professor Kurtz, in reviewing the book, has stooped to the use of arguments that have little to do with science and should not be regarded as acceptable in a scientific context.

H. J. Eysenck
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London, U.K.

Paul Kurtz responds:

I surely did not intend to impugn Professor Eysenck personally. As one who has been the focus of ad hominem attacks, I appreciate his sensitivity. Indeed, I questioned his *ad hominems in* Astrology: Science or Superstition? *against those skeptics and scientists who endorsed "Objections to Astrology." In any case, I did not attack his character or motives, only his judgment. I should add that there is much in his scientific work that I admire, particularly his courage and pluck.*

I said in my review that "Eysenck is well known for his defense of controversial theories and his willingness to jump in and defend unpopular claims even before they are thoroughly tested." This statement is not "irrelevant" in appraising his objectivity regarding the paranormal.

Professor Eysenck has been quoted widely by the tobacco industry, which also questioned "the statistical and methodological weaknesses" of the research supporting a causal link between cigarette smoking and cancer. It is good to have Eysenck's clarification, although the hypothesis at this point seems well supported by the evidence.

Eysenck has also argued for the genetic basis of I.Q. against environmentalists, and this has been taken in part as support for Jensen's views on I.Q. and race (which Eysenck says rests entirely on "circumstantial evidence"). Interestingly, he does not mention Cyril Burt's twin studies, which have now been thoroughly discredited.

The Mayo-White-Eysenck study linking astrological signs and personality was taken at first as a significant support of astrology. Although the authors stated there was a possible alternative explanation—that the subjects' knowledge of their own sun signs and the associated personality features may have been responsible for the results they obtained—they rejected it; and they clearly went on to claim that it is the astrological hypotheses that "have in fact been strongly supported." Only later, after considerable criticism of its methodology, did Eysenck withdraw his original positive appraisal of the study.

Unfortunately, Eysenck does not respond to my principal criticism. I questioned his judgment that Gauquelin's work "stands up to a careful degree of scrutiny," especially since he admits that the "Mars effect" has not been replicated by anyone other than Gauquelin. Eysenck's entire case for astrology rests upon the premise that Gauquelin's research is correct. Nor has he commented on the criticism that the "Mars effect" may be due to Gauquelin's selection process rather than to planetary correlations.

Pilot UFO photo?

Since I was attacked in Philip J. Klass's article "UFOs, Pilots, and the Not-So-Friendly Skies" (*SI*, Winter 1982-83) along with Captain Mathes, I would like to set the record straight for your readers. I had talked to Mathes several years before the March 31, 1975, KGO radio program about the UFO picture he said he took. I was interested in seeing the photo personally, thinking it might be of some value. I asked Mathes to search for the picture, which he faithfully did. He could not find the photo and assumed because of his own casual interest that far back (1958) he had probably discarded it along with other excess material. At this time he was also going through the turmoil of an emotional divorce and had moved his personal residence at least twice.

If he said at the time that he had sent it to NICAP, there is no question in my mind that he did. In the years I have casually known Joe, I have considered him a sincere, honest, and very generous person. In my opinion the latter years of NICAP's struggle under newly acquired leadership and government infiltration (published article by Gordon Lore) were disastrous. NICAP also lost things of mine that I had requested returned to me. Mathes claims the UFO image was small, showed an oval shape but no detail, whereas NICAP may have discarded it themselves as not interesting enough. In addition I am sure they would be reluctant to search for anyone in opposition to UFO beliefs. Checking with Mathes recently, he did tell me that several years prior to the 1975 program he did show the slide at his home to a couple of Stanford University scientists who were interested, but couldn't recall their names.

Klass is in negligible error saying he was one of two guests on the KGO program. Apparently so obsessed in his determined verbal battle with me and the hostile anti-Klass listening audience that he overlooked the third guest, James McCampbell, research director for MUFON. Jim didn't get to say much, as he couldn't get a word in edgewise over the verbal turmoil.

Klass is in error when he states I was the chairman of the Bay Area's "chapter" of MUFON. In the first place MUFON doesn't have "chairmen" and never did have. I was then State Director for Northern California and two months later was appointed Western Regional Director, not that it matters.

Error: it wasn't Captain Mathes who said, "We fly the friendly skies"; it was Klass himself inquisitively asking this in their conversation. (Ref. my copy of the program tape.)

Mathes's book carries several distortions of my assumed verbal statements regarding our inquiries to Lenora, relative to the UFO slides we tested her with. We simply asked her which she felt were real and which she thought were fake. I made no statements referring to "other dimensions," etc., as quoted in Mathes's book.

Gross error: Klass states in his article that I admitted to John Merrell of Beaverton, Oregon, that Klass had been "set up" by me prior to the program. This is an outright falsification because I do not know a John Merrell, in Oregon or elsewhere. I never heard of or saw the name before I read it in Klass's article. If Mathes had known of such a person or corresponded with him, Mathes never mentioned him to me.

Klass claims the KGO listeners were victimized. Since there was no collusion on our part, the only victimizing of the listeners was done by Klass in his usual futile attempt to explain UFOs away as meteors, especially the Ohio helicopter case when Mr. Klass explained the "meteor" came from the east after passing over the 'copter, then took off for the northeast. A turn of almost 180 degrees! Interesting meteor! It's on the tape!

In retrospect, Captain Mathes is entitled to believe in what he wishes, that's his business. He is aware that I

do not share his beliefs.

Paul C. Cerny
Mountain View, Calif.

Philip J. Klass replies:

Cerny acknowledges that his friendship with Mathes dates back at least to 1971 and that he "had talked to Mathes several years before the March 31, 1975, KGO radio program about the UFO picture." Cerny claims he had "asked Mathes to search for the picture," but that Mathes could not locate it and assumed he "had probably discarded it."

Several years later, when Mathes called in to KGO, Cerny pretended that Mathes was a complete stranger, saying: "I would like to have your name and address . . . and would like to get in touch with you and take a look at this slide." This was intentional deception because by 1975 Cerny knew that, if the UFO slide ever existed, Mathes earlier was unable to find it. And when KGO program host Art Finley asked Mathes if he still had his UFO slide, and Mathes replied "certainly," Cerny did not challenge his answer.

Cerny tries to explain why NICAP could find no record of a Mathes UFO slide or report by suggesting that NICAP officials in "latter years" were careless, or that they had lied to me. But in 1958, when Mathes claims he sent the material to NICAP, it was under the able stewardship of Donald Keyhoe, who was a careful custodian of important case files.

During the KGO broadcast, Mathes claimed that NICAP was so impressed with his photo that it requested permission to make a duplicate and subject it to "spectrographic analysis." And about a month later, Mathes claims, NICAP wrote to him to say its analysis showed "no spectroscopic lines that conformed to any particular alloy that they knew of in commercial use at that time." If true, it shows that NICAP knew of the great importance of this alleged UFO photo.

Yet several years later, when NICAP published "The UFO Evidence," listing its best UFO photos and best airline/military pilot reports, there was no mention of either a UFO photo or reported sighting from Mathes.

As for Cerny's claim that "I do not know a John Merrell in Oregon or elsewhere, his memory is flawed. Merrell and Cerny talked by phone and shortly afterward Merrell received a handwritten note signed by Paul Cerny. It expressed pleasure at chatting with Merrell on the phone the previous week and suggested Merrell get in touch with MUFON member Charles V. Blaine, whose address and phone number Cerny supplied. The Paul Cerny signature on this note, photocopy in my possession, looks remarkably similar to Cerny's signature on his letters to the SKEPTICAL INQUIRER.

Psi research: We're all human

In my recent article, "Palmistry: Science or Hand-Jive?" (*SI*, Winter 1982–83) I attempted to show that, when subjected to the scientific examinations available, the occult art of palmistry was lent no support whatever. In that article I alluded to two additional aspects of the practice of palmistry: (*a*) the idea that much of the palmist's "accuracy" is a result of his/her ability to make keen observations of subjects and to then put together "personality profiles" from which further general "psychic" observations may be made; and (*b*) the importance of the subject's desire for an accurate reading and his "cooperation" in the reading. That I should have discussed these ideas (particularly the second) a little further was pointed out to me by a recent experience.

One thing I did not do during my research for the article was to have my palms read! I *knew* that a reading would be accurate in the same way the daily newspaper horoscopes are, so I considered it not worth the time. But

recently I did have a reading done under rather unusual circumstances: at a meeting of anthropologists, *by* an anthropologist! In the course of his research on urban elderly, this colleague had encountered various sorts of mediums and in expanding his research had learned some of their crafts. To no one's surprise, his reading was "accurate." Everything he told me about myself I was able to immediately relate to some aspect of my personality or to some recent events in my life. His tarot reading was no less "accurate." Of course, I knew (and he knew I knew) precisely how he did it: he was a very astute observer of people and I had given him enough information, through our conversation and through, no doubt, such things as body language, speech patterns, and so on, to glean an idea of my basic personality characteristics. In fact, I was able to trace some of his statements directly to certain of these factors. And, when he did a reading for another member of our party, I even found I was able to "make" her reading fit me.

And there's the other, and major, point. Even though I knew what he was doing, at about the same time he was doing it, I realized that, in reality, *I* was doing the work. Despite my skepticism and professed scientific objectivity, I found I *wanted* him to be right. I *wanted* to be amazed and astounded. Something in my ego enjoyed hearing things about me. Something deeper in my psyche gained some satisfaction in hearing about negative aspects of my personality—things perhaps that I was aware of but didn't want to admit to or didn't have a name for. Scientist or not, I, like anyone else, am fascinated by the bizarre, am open to that which feeds my ego, and am in need of various sorts of psychological "crutches" to cope with my fears and problems.

There is an important moral here for those of us involved in research into the paranormal—those of us who enjoy a good debunking now and then: The difference between us and the "believers" lies in the degree and extent of the sophistication of our scientific knowledge and in our ability and desire to apply the scientific method to all manner of natural and social phenomena. But as members of the species and as products of given cultural contexts, we certainly don't differ that much, if at all, in those basic features of psychology and emotion that make us humans.

Michael Alan Park
Central Connecticut State Univ.
New Britain, Conn.

Foul on quotation

Michael Park's interesting article on palmistry (*SI*, Winter 1982–83) illustrates a point that I would like to make with regard to debunkers quoting the opposition. The cause is not advanced with quotations that may be seen as inaccurate, unfair, or distorted.

According to Park, "Watson claims that palmar creases 'break down' at the moment of death, when the signals from the brain, which have maintained them, cease." (He is quoting from Lyall Watson's *Supernature.*)

Watson's actual words, however, are guarded and suggest a process much less precipitate: "The *exact* pattern of the palm print . . . *seems* to depend on the maintenance of these signals, because the lines in the hand *begin* to break down when the impulses cease, at the moment of death." (Italics added.) Watson would, I suggest, be justified in calling foul over the omission of those italicized qualifiers.

I don't believe that Park is guilty of deliberate distortion. But he is, I'm afraid, giving ammunition to the opposition.

W. F. Harris
Dept. of Chemical Engineering
Univ. of the Witwatersrand
Johannesburg, South Africa

Michael Alan Park responds:

Mr. Harris has a good point in noting that inaccurate quotations can amount

to ammunition for the "opposition." To be sure, my rendering of Watson's statement failed to indicate the "guarded" nature of his claim. The point remains, however, that Watson was making a claim for a specific connection, and was supporting it with a specific piece of evidence. The evidence does not hold up either way: the lines neither break down nor *"begin to break down" at the moment of death.*

The Persinger hypothesis

I feel that Ronald D. Story unfairly bum-rapped Michael Persinger in the review of the Nova program on UFOs (*SI,* Spring 1983). Recently I read most of Persinger's works to write a magazine article, and I feel Story's version of Persinger derives more from Persinger's detractors than from Persinger himself.

1. Story refers to Persinger's hypothesis as a "so-called 'theory.'" Whether one agrees or not, it's a theory by definition and needs neither quotation marks nor the accompanying pejorative "so-called."

2. Persinger is not the clearest and simplest of writers, but nowhere in his corpus do I remember any jawbreaker like "piezoelectric-tectonogenic-electromagnetic plasma." That might be a partially legitimate summation of his theory in its earlier forms, but not of his later versions of the hypothesis.

3. Story says Persinger claims that this force "induces only UFO-abduction type hallucinations in the hippocampus of the brain." As I understand Persinger, the electromagnetic force induces hallucinations, but not necessarily limited to the UFO-abduction type.

4. Story asserts that much of the data going into Persinger's theory came from the books of Charles Fort and *Fate* magazine. Persinger did an extensive review of Fortean and *Fate* material in an earlier study of paranormal phenomena. This led him toward the hypothesis connecting earth stress (not just earthquakes) with luminosities (not UFOs in general), but this hypothesis is documented by extensive and legtimate sources (see his long series of articles in the journal *Perceptual and Motor Skills*).

My understanding of the Persinger hypothesis at this time is: (1) he has established a significant statistical correlation between luminosities and earth stress, (2) Brian Brady, who is working on the mechanism for this, has a soon-to-be-announced theory with strong experimental data to support it, and (3) the electromagnetic effect on the brain aspect is separable from the rest of the theory; it is understandably much harder to test, but even if it were not true the rest of the hypothesis is not affected.

Robert Wanderer
San Francisco, Calif.

Persuasive visitor

For the past 28 years I have been a practicing physiologist and, I believe, a skeptical inquirer. In my laboratory I subject my data to appropriate statistical tests and am satisfied when the *t* statistic is greater than 2, signifying probability of less than 0.05. Occasionally a statistic may reach 4, 5, or even 6. The probability in those cases is often less than 0.001. But now I have done an experiment that has offered me the highest *t* statistic I have ever recorded and one that may even be a world record; it was 84! The experiment is worth noting, as I believe others may wish to replicate it.

Two years ago I initiated a course for undergraduate students entitled "The History of Medicine and the Art of Humbug." I try to show students how modern medicine developed through the use of the scientific method and that without it medicine was nearly worthless. (It was only at the first quarter of this century that the chances of surviving an illness were improved upon following the doctor's orders.) If a claim

is made it must stand the rigors of scientific inquiry. In the course I attempt to point out the quack medical fads of our day and hope the students will begin to understand how to tell pseudoscience from science. Chiropractic is high on my list of medical pseudosciences, and on the first day of the course I ask the students to fill out an anonymous questionnaire, two questions of which relate to chiropractors. The students are asked to assign a value from 1-5, denoting strong disbelief to strong belief, to two statements. One dealt with the purported scientific basis of chiropractic and the other with the claim of its efficacy in treatment of diseases. The mean score on the two questions was 3.2 and 3.5, respectively. Both denote a fair level of belief, although some individuals scored at both extremes.

About halfway through the course we began a discussion of chiropractic. Its beginnings were described. The students were told of D. D. Palmer, the owner of a Parlour of Magnetic Healing, and his sudden revelation. We went on to discuss chiropractic literature, claims, etc. At the following session a local chiropractor spoke to the class. He came at my invitation but was in no way misled as to the group he was to address. In fact, he explicitly stated that he preferred to talk to skeptics and was quite used to it. He spoke for almost 40 minutes. This was followed by a question period of one more hour. At all times the class was polite, but always probing.

At the next session the same two questions relating to chiropractors were handed to the class for the same scoring. The mean score for the first question fell to 1.1 (25 students scored 1 and 1 scored 4), which yielded a t statistic of 84! The question relating to efficacy of treatment fell from 3.5 to 1.5, also a highly significant result. I hope that others with concerns like mine may use the same technique. The visiting chiropractor was far more persuasive than I was in getting the students to realize that chiropractic is a pseudoscience.

Richard L. Malvin
Professor of Physiology
Univ. of Michigan
Medical School
Ann Arbor, Mich.

Something about a wall . . .

As a psychologist I'm well aware of our species' talent for self-delusion and of how well our preconceived notions resist evidence. One of the best demonstrations of this penchant happened one day as I was building a stone wall near my woodland home: A passing hunter stopped to chat, rambling on about all the old stone walls that grid the New England woods and how he had been told that the walls had been constructed by past generations of farmers. He said he did not believe it for a minute, since it would have been impossible to make such walls without power equipment. His theory was that the stones must have been left behind by the glaciers.

The point is that all the while he was talking I was moving half-ton stones into place with nothing more than a level, wooden blocks, and rollers. I didn't try to disabuse him of his theory since he had the shotgun.

Norman E. Tandy
Winchester, N.H.

The task still ahead

We now know the answer to the question, Why does Randi pursue and expose so-called psychics' claims? The answer was provided to us by a caller-in to a radio talk-show on WERE-AM here in Cleveland hosted by Norma Josephs: Magicians are against psychics because psychics are a threat to their livelihood. The caller explained, "Why should the public pay to see magicians do it by trickery when psychics can do the real thing?" The caller

also explained why Uri Geller failed all of the scientific tests (even those of Targ and Puthoff?)—because all the scientists themselves are frauds.

Although it would seem that this is just another example of the gullible public being successfully taken in by Geller and his cohorts, it really seems to provide a graphic example of just how far *SI* and its readers still have to go. Keep up the good work.

Dr. Steven N. Shore
Lys Ann T. Shore
Cleveland Heights, Ohio

Correction

A statement in our summer 1983 issue (p. 18) saying that Stanley Krippner had characterized James Randi's Project Alpha as a "much-needed" experiment was incorrect. That comment was made by another scientist, not by Dr. Krippner. We apologize.—ED.

The Psychic Anecdote II

During the first stage in the development of the psychic anecdote, the narrator usually tells his story, not as something he cannot understand, but simply as another example of the supernatural in his own experience. To him telepathy, clairvoyance or the actions of discarnate spirits are *the explanation of the event or experience in question. And so, when he narrates his story, the details become subordinated to the central theme of telepathy or some similar idea; the story is no longer objective.*

The first narration of the story fixes the pattern of subsequent narrations. Since the point of telling such a story is to be believed, the narrator in his enthusiasm will tend to add embellishments, emphasizing favourable points, omitting unfavourable points. After two or three repetitions these additions and omissions will become part of his memory of the incident; he will be prepared to swear to their trust with absolute sincerity. This process, in which the imagination becomes fused with the memory, is known to psychologists as retrospective falsification.

The final development of the psychic story is reached when the distorted version of the event becomes so completely part of his memory that no argument will avail to convince him of its falseness. This almost invariably occurs with those who believe strongly in the occult. Furthermore the whole cumulative process tends to make the original experiences seem a great deal more striking and distinctive than they really were; and the story will often emerge with a trenchancy and simplicity which baffles the rational listener.

People of the highest intellect may deceive themselves in this way. . . . Well-educated and otherwise intelligent people will write the most ludicrous and impossible stories with transparent honesty and sincerity of purpose. The fact is that once a supernatural interpretation of an event has become accepted, *the memory of that event will become inevitably and irrevocably distorted.*

—D. H. Rawcliffe, in *Illusions and Delusions of the Occult and Supernatural* (New York: Dover, 1959).

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Paul Kurtz, Chairman

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(groups with aims similar to CSICOP's)

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Pennsylvania: Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh 94530.

Texas: Austin Society to Oppose Pseudoscience (A-STOP), Charlotte M. Cranberg, President, P.O. Box 3446, Austin 78764.

The Committee for the Scientific Investigation of Claims of the Paranormal

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- Prepares bibliographies of published materials that carefully examine such claims.
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- Publishes articles, monographs, and books that examine claims of the paranormal.
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